The Orchadian

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Official Journal of the Australasian Native Orchid Society

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Calochilus robertsonii Photo Jim Cootes

The Orchadian

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June 2012 Volume 17 Number 4

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President's Report

The most important event of the year is closing fast, that is the 2012 Annual General Meeting for ANOS. This will be held on Saturday 1st September 2012 at the Kempsey Heights Bowling Club, commencing at 4.30pm.

On the same weekend is the Kempsey Speciosum Spectacular hosted by the Walmsley family, a fantastic weekend for orchid growers.

This event has been running for a number of years, and continues to attract growers from all over Australia, and gives ANOS the ideal opportunity to have a large number of attendees.

The Spectacular itself, caters for all classes of orchids, not only speciosums, and has a variety of vendors catering for all your needs.

Congratulations to all the winners of the recently announced Ira Butler Committee Awards, all very deserving winners and placings. The Committee does a fantastic job of the final judging and collation of the nominations.

This year's flowering season promises to be brilliant, with many new seedlings in spike, and *D.* speciosums commencing to initiate. Hopefully we can see the many new hybrids made recently to be of such a quality to win their sections in shows.

Reports from Victoria indicate this year's flowering especially in speciosums will be the best ever, hopefully growers will have success at the various shows organised by all the ANOS Groups.

The ANOS AGM will see all positions declared vacant, and we are always looking for fresh faces to add to the fantastic Committee and Councillors, we currently have representing you the members.

ANOS AGM
Notice of meeting

Saturday 1st September 2012
Kempsey Heights Bowling Club
10 Polwood Street, West Kempsey.
Time: 4.30pm

All positions will be declared vacant, and nominations are called for the following positions.

President
Vice-President
Treasurer
Secretary
Editor
Conservation Officer
Website Controller
Membership Officer
Councillors

All nominations are to be in the hands of the Secretary not less than 7 days prior to the AGM.

Editorial

I still need more articles especially on hybrids. I am trying to maintain a balance between species and hybrids and scientific and hobby articles.

I had a good response to publishing the photographs illustrating the new registrations of Australian orchid hybrids and I will try to continue this.

Graham Slater and others are working on a list of Australasian Orchids. This is proving much very hard to identify some of the parents. One good thing it is not like Odontoglossums, where there are a lot of early hybrids for which the parents are unknown. Graham Slater is now preparing a list of new registrations of Australasian orchid hybrids for publication. The first list is published in this issue. I will also try to illustrate this list with photographs.

Some societies send me show reports, it is interesting to members in other parts of the country to see what is being exhibited and how well orchids grow in your areas.

I would be interested in publishing reports on other activities such as field excursions.

I am still looking for images to illustrate the article on Queensland *Prasophyllum* which needs illustration. If anyone has photos of Queensland *Prasophyllum* and *Genoplesium* could they please sent them to me to illustrate this article.

The AGM of ANOS will be held on Saturday 1st September at 4.30pm in the West Kempsey Bowling Club. All members are encouraged to come to the Speciosum Spectacular and attend the AGM on the same weekend.

In the last issue the results of the Bill Murdoch Trophy for 2011, the awards for *Dendrobium tetragonum* 'Bellingen' were not mentioned.

It should have read—*Dendrobium tetragonum* 'Bellingen' AM/AOC-NSW

Some hybrids of *Dendrobium* [*Dockrillia*] are still causing problems. Graeme Beddow has done a lot of research into these orchids. I hope to be able to publish some articles later. Some societies have started to have a single class in their schedule for *Dockrillia* including both Australian and Australasian hybrids to stop the confusion.

Ian Chalmers
Editor

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ANOS Shows 2012

ANOS Mid North Coast Group
Speciosum Spectacular
Saturday 1th-2nd September 2012 – 57 Spooners Ave, Greenhills (Kempsey)

ANOS Newcastle Group
Spring Show
25th August 2012 Charlestown Bowling Club 5 Lincoln Street, Charlestown

ANOS Central Coast Group
Spring Show
5th – 9th September 2012 Australian Springtime Flora Festival Mt Penang Parklands Kariong

ANOS Warringah Group
Spring Show
Saturday 8th & Sunday 9th September. Venue: Forestville Memorial Hall, Starkey Street, Forestville

ANOS Sydney Group
Spring Show
Saturday 15 th- 16th September 2012 Eastwood Shopping Centre

ANOS Illawarra Group
Spring Show
14th - 16th September 2012, Old Court House, Cliff Rd. Wollongong

ANOS Macarthur Group
Spring Show
Saturday 22nd September 2012 Narellen Shopping Complex outside Narellen

NOSSA Spring Show
September 23, 2012

ANOS Vic Spring Show
September 29th & 30th – Mount Waverley Community Centre

ANOS Melbourne Suburbs Group Inc. Australasian Native Orchids Spring Show
Lilydale Lake Community Hall
Sat - Sun 6-7 October 2012 - 10am -4.30 pm
Web. www.anosvic. org.au

Illawarra Group
Sarcochilus Show
12th 13th 14th October 2012 Old Court House, Cliff Rd, Wollongong

ANOS Central Coast
Sarcochilus Show
11th Annual Sarc Show 20th & 21st October Bushlands Nursery 443 The Entrance Rd, Erina Heights

ANOS Newcastle Group
Sarcochilus Show
Saturday 20th October 2012 Adamstown RSL Main Street Adamstown

ANOS Sydney Group
Sarcochilus Show
Castle Glenn Community Centre Ridgecrop Drive Castle Hill Sunday 21st October 2012r

ANOS Macarthur Group
Sarcochilus Show
Saturday October 27th 2012
Narellen Shopping Complex,
Queen and Elyard and Somerset Sts.
Narellen

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www.australianorchidfoundation.org.au

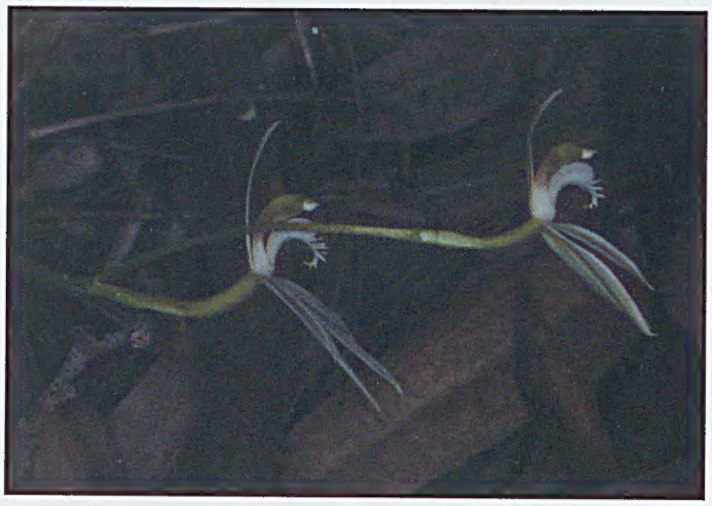
Discovering Suburban Bushland Orchids

Jim Cootes and George Tiong

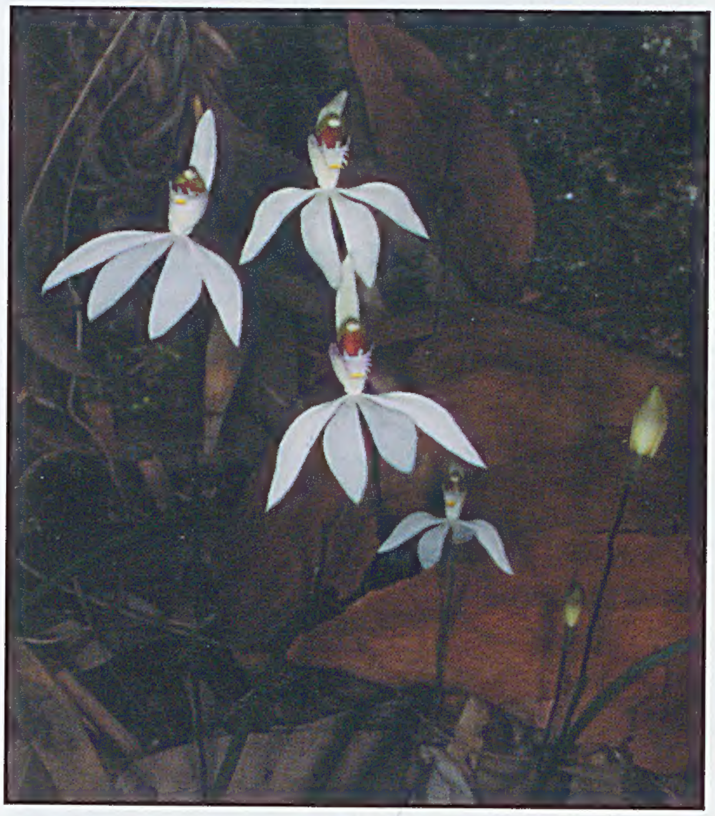
What started as a leisurely stroll through some local bushland in Oatley, Sydney, during last winter has led us to discover a number of the most delightful native orchid species.

We initially visited the bushland reserve as part of an introductory study of the vegetation community and species associations of the area. The predominant geological material here is Hawkesbury Sandstone, which produces shallow, nutrient-poor and sandy soils, interspersed with small pockets of deeper and more fertile soils wedged between sandstone boulders and rocks. The southerly aspect of the site means that the slopes are mostly protected from the direct rays of the sun and consequently humidity is relatively higher, while its location beside the estuary of the lower Georges River ensures that temperatures are more even compared with the exposed ridge-top areas. The vegetation community is classified as Sydney Sandstone Gully Forest, which is renowned for the great diversity of species that inhabit open forest, woodland and even heath. The dominant trees are the Sydney Red Gum (*Angophora costata*), Sydney Peppermint (*Eucalyptus piperita*) and Red Bloodwood (*Corymbia gummifera*). Amongst the many plants that we identified, there were a number of orchid species.

On our initial walk into the area in late May 2011, we found many plants of *Petalochilus catenatus* (syn. *Caladenia catenata*), in both its white and pink forms. Usually the inflorescences bear a single bloom but we have found one clone with a two-flowered inflorescence. Because of the colouration of this delightful species, the plants were readily obvious in the shadows of the hill slopes.



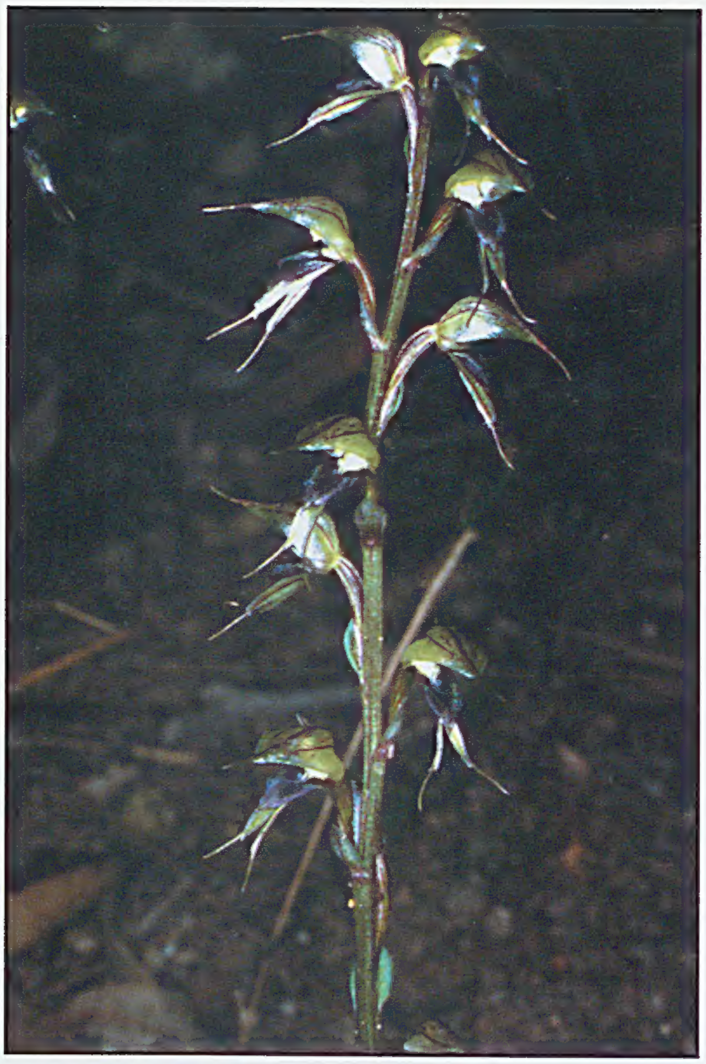
Petalochilus catenatus
2- flowered inflorescence.



Petalochilus catenatus

A closer examination of the area also uncovered the far more somberly coloured *Acianthus fornicatus*. These plants grow in positions that retain a little more dampness, with many of the plants growing in mosses on the edge of the track. The numerous, brownish-green flowers are well-spaced, on an upright inflorescence.

On the way back to the car, we noticed a large number of small heart-shaped leaves growing beneath a large *Angophora costata*. The senior author

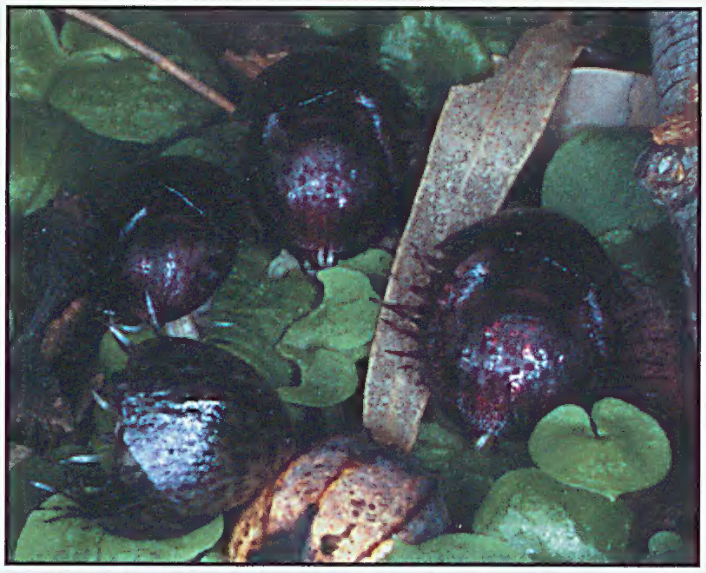


Acianthus fornicatus

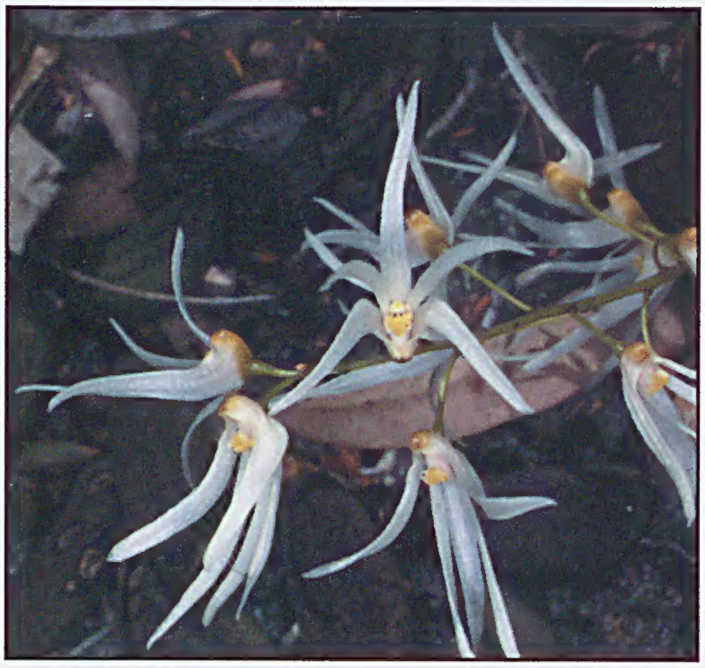
Jim Cootes took some pictures and forwarded one of the images to Mike Harrison, well-known Sydney native orchid authority. Imagine our surprise when Mike told us to look closely as there are little purple hoods amongst the leaves. These little purple hoods were in fact the dorsal sepals of *Corybas fimbriatus*, a species which we had not seen in the wild previously. The next time we went to the site, we looked very closely, on our hands and knees, and there was indeed a multitude of the odd little blooms of this species.

A number of the sandstone boulders, which are found throughout the area, have clumps of the delightful *Dockrillia linguiformis* clinging tenaciously to the surface of the rocks and amongst the leaf litter. In the spring time there is a profusion of milky-white blooms, with a bright yellow labellum, making a wonderful display.

In the late winter, we noticed 4 leaves growing from some very sandy soil on top of a rock, which we suspected belonged to an orchid genus. Each time we visited the site, we observed the progress of the leaves, and were pleased to notice that inflorescences



Corybas fimbriatus



Dockrillia linguiformis

Dockrillia linguiformis

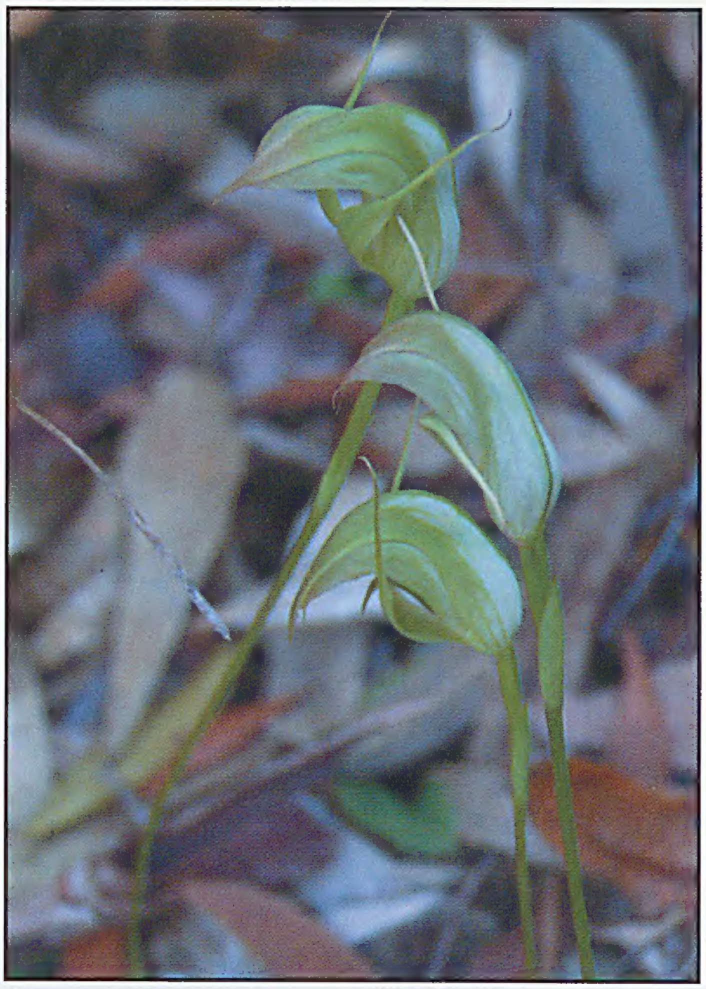
were forming from two of the plants. Several weeks later, upon our return, we were very happy to see *Calochilus robertsonii* (pictured on front cover) in all of its glory. This is a most delightful flower with its long reddish beard. Other clones of this species were noticed regularly along the track, growing in shaded localities, where the soil seems to remain damp.

A little further along the track growing in damp, shaded localities were little colonies of *Pterostylis nutans* and *Pterostylis concinna*, with their single green flowers. *Pterostylis nutans* was quite common in the area, whereas we only found the one clump of *Pterostylis concinna*.

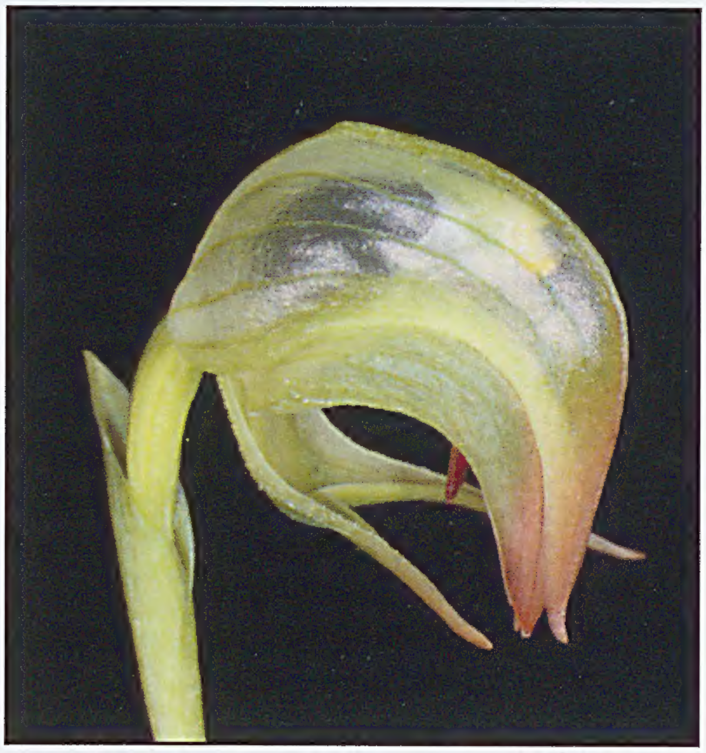
On another occasion in late winter, when the wild flowers were in full bloom, we started to head down a road when a splash of brownish-yellow caught our attention amongst the leaf litter. We were surprised that the plant was *Erythrorchis cassythoides*, growing along on the top of the leaf litter and sandy soil. On all other occasions that we have observed this species, it has been growing vine-like on the trunks of *Angophora costata*. The blooms are most attractive and resemble some *Vanilla* taxa.

Further on down the road we observed a second species of *Calochilus*, *C. paludosus*, with its lovely bearded-flowers. The locality is very bright, and the plants would get less than 40% shade for the whole day, and the soil appears to be very well-drained.

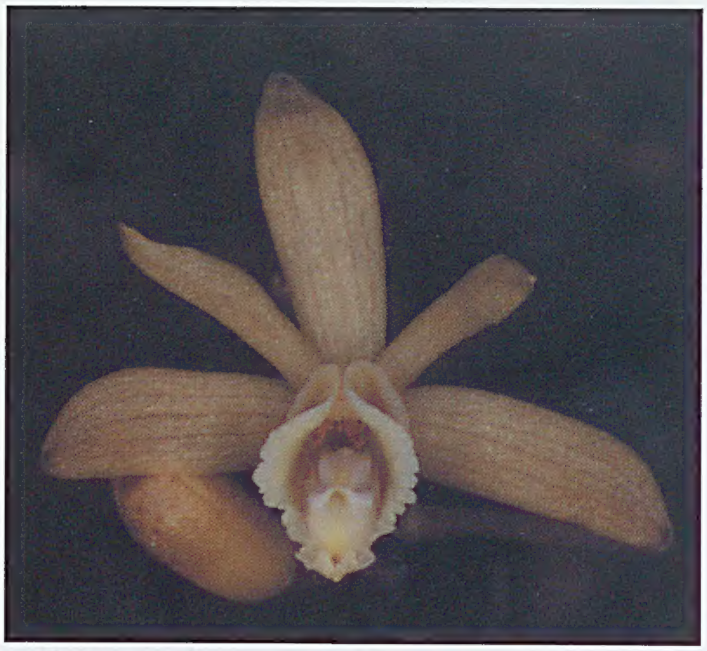
One November morning, the senior author visited the site and noticed a number of newly formed inflorescences, some up to 80 cm tall, which appeared to belong to an orchid species. Our sense of anticipation was heightened by the numerous buds forming on each spike. When the flowers finally opened, it was the beautiful *Dipodium variegatum,* a saprophytic species with a tiny leaf at the base. This species is easily distinguished from similar coloured species by the maroon-spotted pedicel and ovary. The largest inflorescences reach a height of over one metre, bearing numerous delightful pink and maroon-spotted blooms about 3.5 cm in diameter. We have subsequently observed many more colonies of this



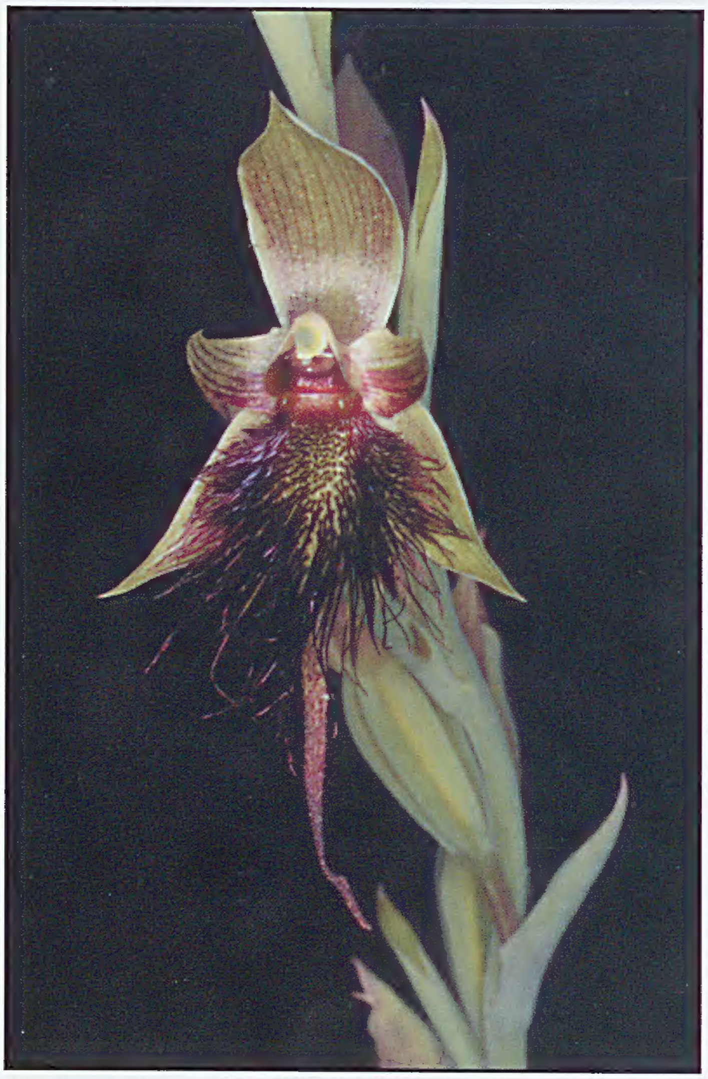
Pterostylis concinna *Photo George Tiong*



Pterostylis nutans



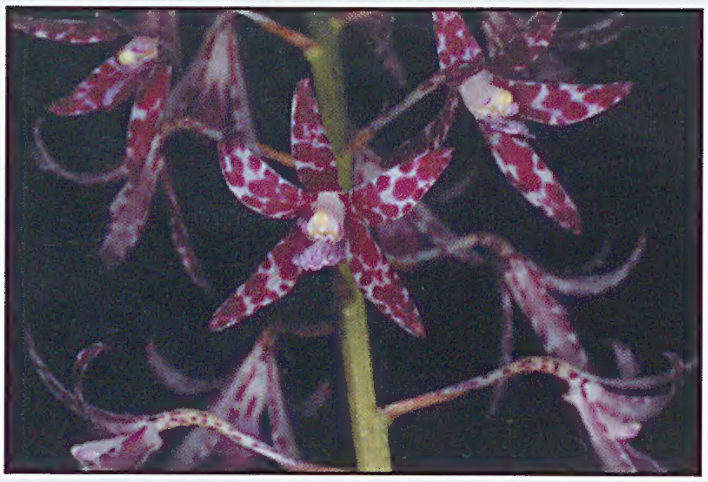
Erythrorchis cassythoides



Calochilus paludosus

magnificent plant.

As with any bushland site, there are undoubtedly more orchid species waiting to be discovered. Terrestrial orchids are often inconspicuous and are visible for only a few weeks during the year, mostly in late winter and early spring. It is clearly desirable to visit the site several times over winter and spring, in case plants have been overlooked, and as flowering times vary among species.



Dipodium variegatum

All photographs taken by Jim Cootes unless otherwise stated

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7th Australasian Native Orchid Conference & Show Strathpine 2013

It is now half way through 2012 and the 7th Australasian Native Orchid Conference and Show is drawing closer. The hosting society A.N.O.S Kabi is on track with their time line in meeting deadlines to arrange a memorable and successful event. The various committees are finalising some of the major items of the conference now and will release that information soon. This will allow interested orchid enthusiasts to plan their attendance to enjoy the many facets of a conference and show of this type.

The latest up to date information will be regularly posted on their web page www.ourshopfront.com/kabi

The prices are being finalised for the functions, when this happens the registration forms and information will be made available on the A.N.O.S Kabi website. As in past conferences there will be an early bird offer for those who know it will be an opportunity to be part of a great conference to see beautiful plants or even show their plants, be part of a sharing of information with the latest on breeding and culture as well as conservation and field studies.

There will be a bus trip to take people out into the bush not too far away from Brisbane city to show participants the plants growing in their natural habitat enabling those interested to have a better idea of the actual environment the plants can be found in, this in turn can help people understand what they may need to provide in their growing environment to be able to grow these plants, they will be guided by a local member that is also an avid bush walker and expert on the local plants with years of local knowledge many epiphytes and terrestrials can be found in the Brisbane basin and surrounding country.

The show schedule was refined to reflect the plants that could/should be flowering at the end of August with an emphasis on the south east corner of Qld where a bulk of exhibitors will be from.

Data from the annual KABI shows that are run about the same time as the conference were used as well as what plants were exhibited in the last conference and the ANOS parent group requirements be included in the schedule.

The Show is to appreciate the actual plants either as individual plants on the bench or as part of a living display that captures the viewer's imagination. The conference theme is nature's diversity and we hope to see some interesting takes on this theme.

There will be room for a number of large displays 3x2 meter with A.N.O.S societies given first opportunity to be participants and if they do not take on the larger display areas they will be opened up to other societies to fill. There will also be a number of table top display areas available, this is then complemented by the individual plants on benches.

We do ask any A.N.O.S societies who are interested in putting on a Display to let the show committee know after receiving the brochures and schedule to see if we have any places to offer local societies.

This also then allows both individuals and groups to plan and participate to be inclusive allowing orchid enthusiasts who are part of a society as well as those who are not and may not normally partake in a normal show environment but have exceptional plants.

We at Kabi are sure any one that attends the 7th Australasian Native Orchid Conference and Show will come away enriched by the whole experience and look forward to meeting all that come be it for the show or the lectures and functions.

The Conference Marketing committee

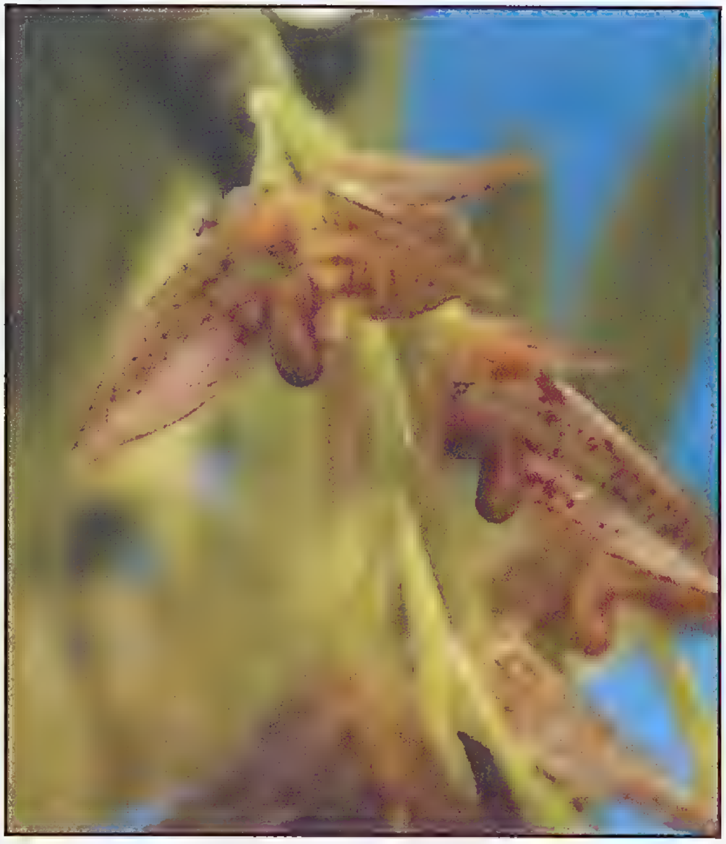
Bulbophyllum Ochre Arches

Gerry Walsh

A new direction in native hybridising

Late last year, I registered a most unusual Australian native orchid hybrid. It has in fact escaped the attention of most of the orchid magazines and bulletins that have a section headed: 'New RHS Orchid Registrations'. No one ever thinks to look in *Bulbophyllum* for new hybrids, and not surprisingly.

In 1996 I was roaming through the bushhouse looking at the new flush of flowers that came with the Spring of that year. I had a great showing of both *Bulbophyllum elisae* and *B. bracteatum*. Both of these are cold growing temperate species.



Bulbophyllum Ochre Arches 'Babylon'

I remember thinking that they were the only members of their genus from southern Australia having long, multi-flowered racemes. *B. elisae* has racemes to perhaps 175 mm long with up to 12 blooms that are around 18 mm across. *B. bracteatum* gets racemes to around 120 mm long with around 25 blooms tightly arranged, and about 10 to 12 mm across.

Bulbophyllum Ochre Arches

Although I'm not a hybrid grower, it occurred to me that a crossing of the two might produce a floristic, long-racemed orchid with flowers that would look like who knows what? Plenty of flowers would be the expectation, but of unknown colour and shape. The big advantage is that the product would be cold growing. So I did it! The *B. bracteatum* carried the pod.

The ripe capsules went to Macquarie Native Orchids for flasking and I suspect Mike Harrison may not have been too impressed with the prospect. I think we were both surprised that good germination was achieved. The flasks went on sale; I received one and mounted up the little plants then promptly forgot about them for 10 years.

A flask found its way to New Zealand. Seedlings went on sale and my brother Daryl, kiwi resident for over 45 years, purchased a few of them. First flowering I heard about was Mr Graeme Leif Berg in the North Island. I know nothing of the quality of that one however. My brother flowered his soon after.

In Australia, flowering was not nearly so quick. Mr Denis Sinclair flowered it when he lived at Dorrigo around about 2004. I didn't see the plant but there was one report that it was not impressive. My own flowering was not very good either. This was five years ago. The raceme aborted when only 50 mm long but the flowers remaining were nice in my own humble opinion.

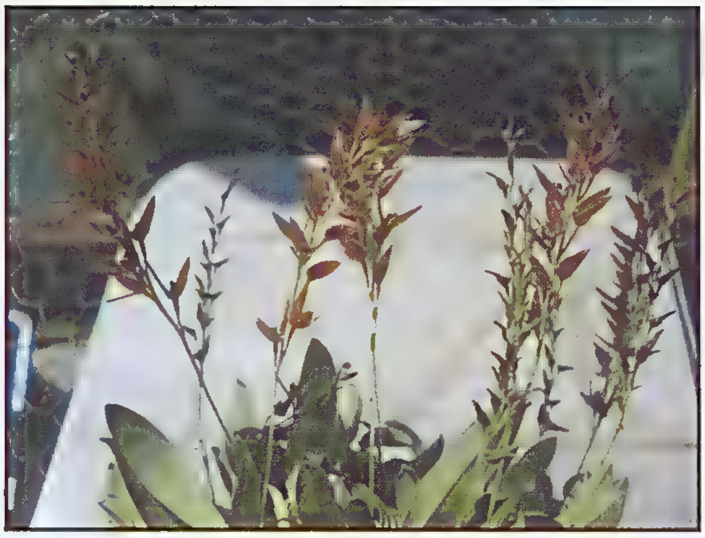
Meanwhile, Daryl in NZ continued getting wonderful flowerings from his now quite large plant. It won prizes at several orchid shows and bragging rights were big on the email exchanges I can tell you. Good on him.

Nothing more was heard about the hybrid until last year when I received notice that people in Victoria had flowered it. They didn't recognise the flowers however and they'd always assumed it was a species they were growing all that time. Congratulations go to Mr Peter Miller of the Hanging Garden Nursery for his success.

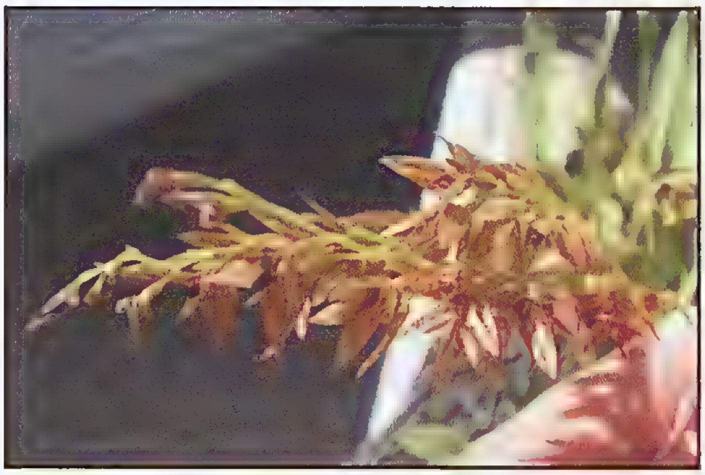
So, they loved it, I liked it, it was easy to grow, but difficult to flower unless you lived in NZ. I was persuaded to register it with the RHS at Kew Gardens. As you will see from the photos, it has a lovely woody, or ochre colour that fairly glistens. I thought about the name for a good while and finally decided on Ochre Arches based on habit and colour. And that's the whole story. So much for me being a hard-core species grower I hear you say.

I haven't flowered my one surviving plant since the first success. I really hope that the Victorians do well with their plants. It might even be reproduced in flasks again some day. I really think it would be worthwhile.

B. Ochre Arches is only the second registered *Bulbophyllum* hybrid made exclusively with Australian parents. The first one was *B.* Alpha, which was a crossing of *B. longiflorum* x *B. baileyi*. This was registered by Mr Wal Upton back in 1985. I've never seen a photo of it.



Bulbophyllum Ochre Arches



Bulbophyllum Ochre Arches 'Babylon'

Possibly there are other specimens of *B.* Ochre Arches hanging around in other bush houses. It would be easy to assume that it may never flower and that the plant may be a species; the hybrid is similar in growth habit to *B. bracteatum*. I'd love to hear from growers out there who may have plants of *B.* Ochre Arches, either flowered or unflowered.

Gerry Walsh (gerry@therocklilyman.com)

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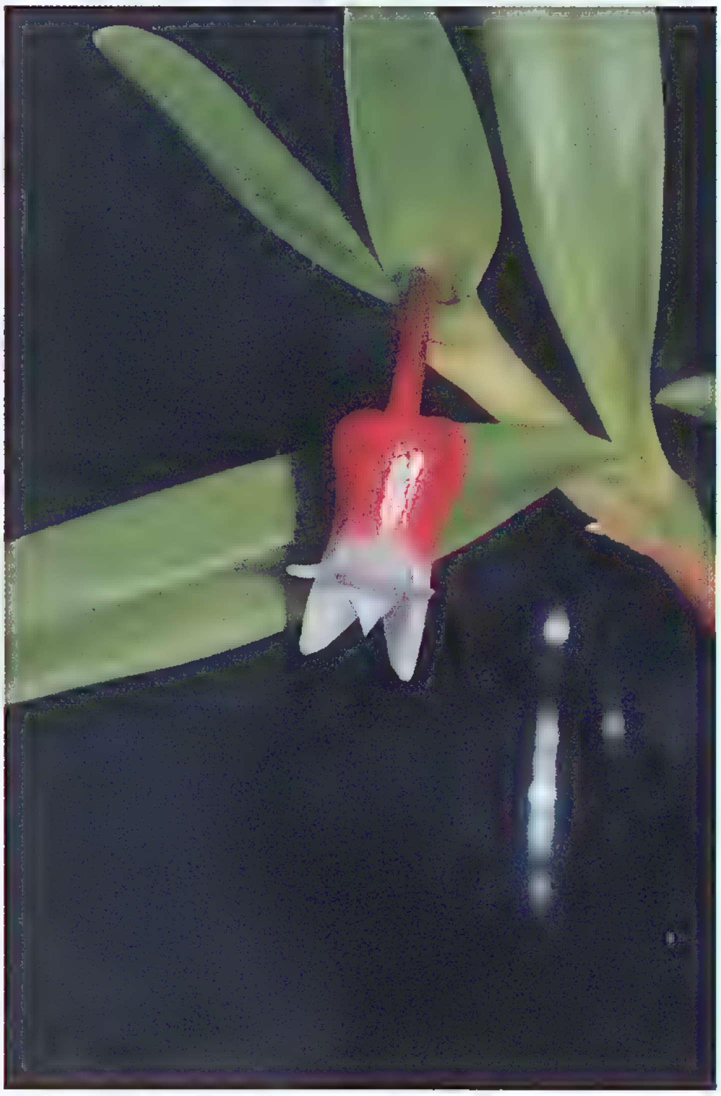
ANOS Melbourne Suburbs Group Spring Show, October 8-9th 2011.

There were some initial concerns about prospects for success prior to the show this year – a clash with the AFL Grand Final, poor weather forecast, several members unavailable, and a relatively poor flowering season.... BUT it always seems to come together in the end, and we need not have worried. Set up on Friday went smoothly and even finished earlier than in previous years. An increased number of members put up quality individual stands, including some novices. Judging occurs at 8 am on Saturday morning prior to the show opening at 10 am. This keeps the judges on their toes to get through the classes efficiently, as prospective buyers form a queue well before the doors open. The compulsory pointing up of outstanding and other plants is done after the show opens, giving the judges the opportunity to make a less hurried assessment.

The hall was again looking bright and inviting for visitors. David Brewster provided a continuous power point presentation of orchid programs, including local terrestrial orchids, and orchids of New Guinea. Poster information on commonly grown species always attract attention, and members were available to answer enquiries. The display hall overlooks the picturesque Lilydale Lake, and inquisitive picnickers wander over to see the show, as well as the Fly Fishermen Club members, who share the hall with us on Sunday.

We have been experimenting with some new judging sections to complement the usual classes. One is a section for natural, rather than line bred, *Dendrobium kingianum* and *D. speciosum*, to encourage members to grow the species and exhibit the natural range of colours and other variations. *Dendrobium kingianum* often cannot compete in judging with line bred plants, but have a special charm of their own, and are better appreciated when judged separately. We encourage members to be creative in displaying small flowering and foliage orchid by having a Decorative Pot(s) section, which has very few rules, and gives members a chance to use their imagination. The public are always drawn to this section, and there are guidelines for judging the exhibits, including considering plant quality, arrangement, finishing and accompanying information for the benefit of those less familiar with orchids.

Daryl Williams' display was again outstanding and voted best, with his wide range of Australasian species. His plant of *Mediocalcar agathodaemonis* was much admired, as it is a delightful



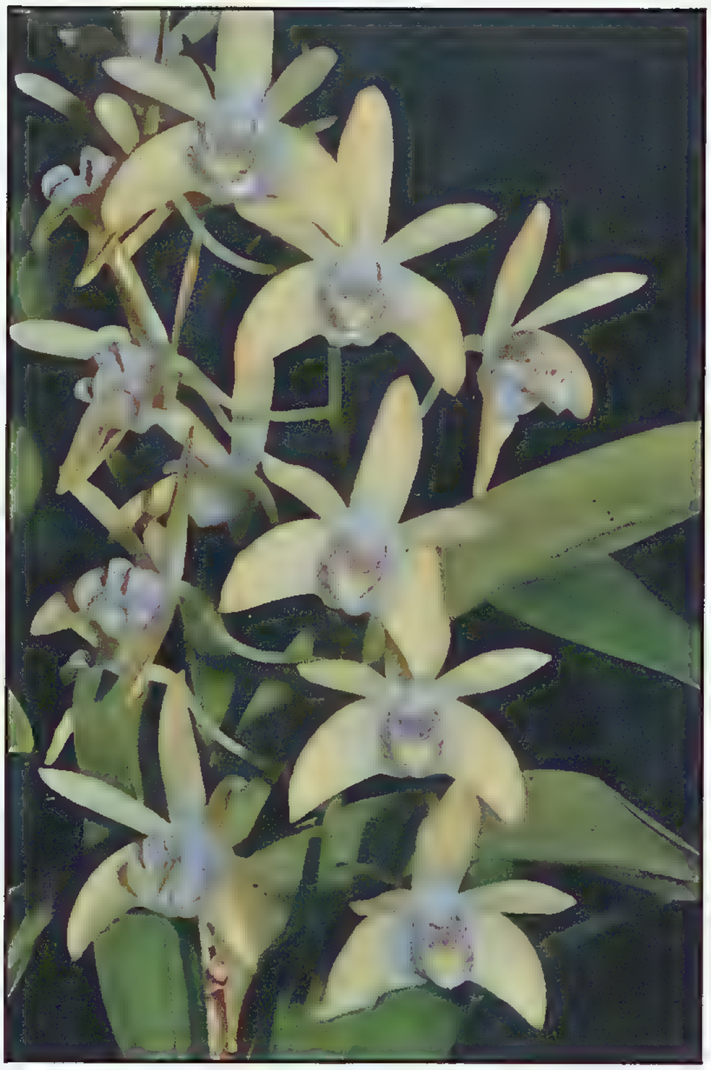
Mediocalcar agathodaemonis

and colourful New Guinea species not often seen in Melbourne. Jenny Wilson exhibited a beautifully grown and flowered specimen of *D. striolatum*, which was awarded Best Orchid by a Novice. Another novice grower, Pam Dower, was unlucky not to win a major award with a spectacular specimen of *D. linguiforme*, which unfortunately was just starting to lose flower substance.

Despite the generally poor flowering of *Dendrobium speciosum* in Melbourne this season, three plants made it to the show, and the Best Specimen was a large example of *D. speciosum* var. *hillii* 'Silky Oak', which provided a spectacular display near the entry. Flowers of this variety often fade early in Melbourne, and individual flowers can deteriorate shortly after opening, spoiling the display, but the cool weather meant they stayed in very good condition for the duration of the show.

D. speciosum var. *hillii* 'Silky Oak'

Best hybrid was *D.* Jesmond Gem 'Apricot Pie', which was later awarded AM/AOC. This plant is a late developing sibling of *D.* Jesmond Gem 'Olive Adams' FCC/AOC, which was discovered entangled with a white flowering seedling when it produced an unusual yellow- orange flowered raceme for the first time, two years after the FCC award. This year the flowers did not develop the strong orange blush of earlier years. Best Species was the seventh generation line bred *D. kingianum* 'Jacques Miller', later awarded HCC/AOC. It is a product of combining the awarded Candystriper and Dragon lines, with well presented very pale mauve flowers of heavy substance and with a wide candystripe labellum. The plant flowered for the second time and has potential to improve further when it develops into a larger size. The points scored by the above three plants confirmed them as benchmarks in the archival log of exhibited plants of the group.



D. Jesmond Gem 'Apricot Pie'

D. kingianum 'Jacques Miller'

Best Other Species or Hybrid was awarded to the very beautiful and unusual *Bulbophyllum elisae* x *B. bracteatum*, exhibited by Peter & Margaret Miller. This cross was originally made some years ago by Gerry Walsh, and he has subsequently registered it this year as *B.* Ochre Arches. It is the second Australian hybrid of *Bulbophyllum* registered, the first being *B. longiflorum* x *B. baileyi*, registered as *B.* Alpha by Wal Upton in 1985.

Melbourne Suburbs Group is relatively young and has a high percentage of novice growers and a strong judging panel including five newer trainees. The novices are very keen and their collections are expanding quickly. We are planning to increase the number of sections for novices next year because of the high number of plant entries, and to encourage more participation by novices, who also keenly support the running of the group and the show.

ANOS JUDGING PANEL IN VICTORIA

In January 2012, after a five year establishment and training period, the first group of trainees in the ANOS Judging Panel passed their examinations to become certificated judges. John Sharam, David Henshall, Peter Miller, Keith Riseley, David Brewster, Sheryl Lawson and Peter Adams are now Certificated ANOS Judges, the first stage of becoming fully qualified judges. The curriculum was based on the NSW training program, and extended and supervised by the Victorian Registrar, Dr. Peter Adams. The trainees have completed their dissertations and presented them, a prerequisite for promotion to Associate Judges.

A further five trainees are in the process of completing their studies. The Panel continues to meet five times per year for ongoing training, revision and updating of knowledge.

It is a major achievement for ANOS to finally have a judging panel established in Victoria, and will give Victorian growers the chance to receive recognition for quality Australian and Australasian plants in the future.

Pictured at an ANOS Melbourne Suburbs Group meeting are (L to R) David Brewster, Svitlana Pantelejenko (trainee), Jenny Wilson (trainee), David Henshall, Sheryl Lawson, Peter Adams

Habitat of the Leafless Tongue Orchid *Cryptostylis hunteriana* Nicholls throughout its known Australian distribution

Claire deLacey, Stephen Bell, Steven Chamberlain and Karl Bossard
Corresponding author. Email: sajbell@bigpond.com
Research project funded by the NSW Environmental Trust.

Abstract The realised habitat of the threatened cryptic saprophyte, the Leafless Tongue Orchid *Cryptostylis hunteriana* Nicholls (Orchidaceae), has been documented for its entire Australian range. Using floristic data collected from 108 samples at known habitats, a numerical classification was developed which describes eighteen vegetation communities spanning the States of Queensland, New South Wales and Victoria. Floristically, the species has been recorded from high elevation grassy forests on Tertiary basalt, through a range of open forests and heathy woodlands on various sedimentary geologies, to wet heaths and wallum scrubs on Quaternary sands. This range of habitats extends from elevations of 10 m ASL in southeastern Queensland, to over 1200 m ASL in northern New South Wales. Evidently, this species potentially inhabits large areas of eastern Australia across many habitats; however, confirmed records are relatively few confirming its threatened species status.

Introduction

Tongue Orchids (*Cryptostylis*: Orchidaceae) comprise around twenty species worldwide, occurring in Malesia, New Caledonia, Melanesia and Australia (Jones 1993; Weston 1993). Unlike all other *Cryptostylis* species, the saprophytic Leafless Tongue Orchid *(Cryptostylis hunteriana* Nicholls*)* can be particularly hard to detect outside of its short flowering event due to its subterranean habit and the lack of persistent foliage. The species is listed as Vulnerable on Schedule 2 of the NSW *Threatened Species Conservation Act 1995* (TSC Act), and also as Vulnerable under the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). It has a RoTAP coding (Briggs & Leigh 1996) of 3VC–, indicating that the species is vulnerable, has a geographic range greater than 100 km, with at least one population (population size unknown) occurring in a conservation reserve.

The main identified threats to the Leafless Tongue Orchid are disruption or loss of natural habitat through development pressures in many coastal regions (NSW DECC 2005a; Department of the Environment 2008). Lack of knowledge on preferred habitat can place species at risk in areas undergoing rapid and intensive development. This is also the case in areas subject to mining and fire management activities where fire intervals may limit the long-term perpetuation of some species. Additionally, under current guidelines for impact assessment and assessments relating to Biodiversity Banking and Bio–certification, there is no requirement to provide seasonal surveys for cryptic, deciduous or otherwise hard to detect threatened species. Such knowledge is imperative when areas of land are being assessed for potential impacts from land-use changes, so that tests of significance can be applied in a more informed arena whilst reducing the potential for unmeasured loss of diversity. For example, in New South Wales, Section 79C(1)(b) of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) requires consideration of '...

the likely impacts of that development, including environmental impacts on both the natural and built environments...'. Particularly relevant in this regard is the '7 part test' under s5A(2) of the EP&A Act in relation to threatened species. The test is designed to determine '*...whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats ...*' (s5A(1) of the EP&A). A better understanding of what constitutes preferred habitat for such species can improve our ability to meet conservation objectives for threatened species and their habitats.

With financial support from the Environmental Trust, we examined the realised habitat of the Leafless Tongue Orchid throughout its entire Australian distribution. Two earlier papers have addressed localised habitat requirements for populations of this species, on the NSW Central Coast (Bell 2001) and in the NSW Shoalhaven area (Clarke et al 2004). One of the aims of the current study was to extend the earlier work, and to facilitate determining authorities to evaluate where this threatened cryptic plant species is likely to occur. This has been illustrated through a combination of detailed data collected from sites known to support the species, numerical classification analysis to define occupied vegetation communities, and predictive mapping of potential habitat (deLacey et al submitted). The current paper provides a summary of habitat types know to support the Leafless Tongue Orchid in Queensland, New South Wales and Victoria; full details of the larger study, including the results of predictive mapping, can be found in deLacey et al. (submitted).

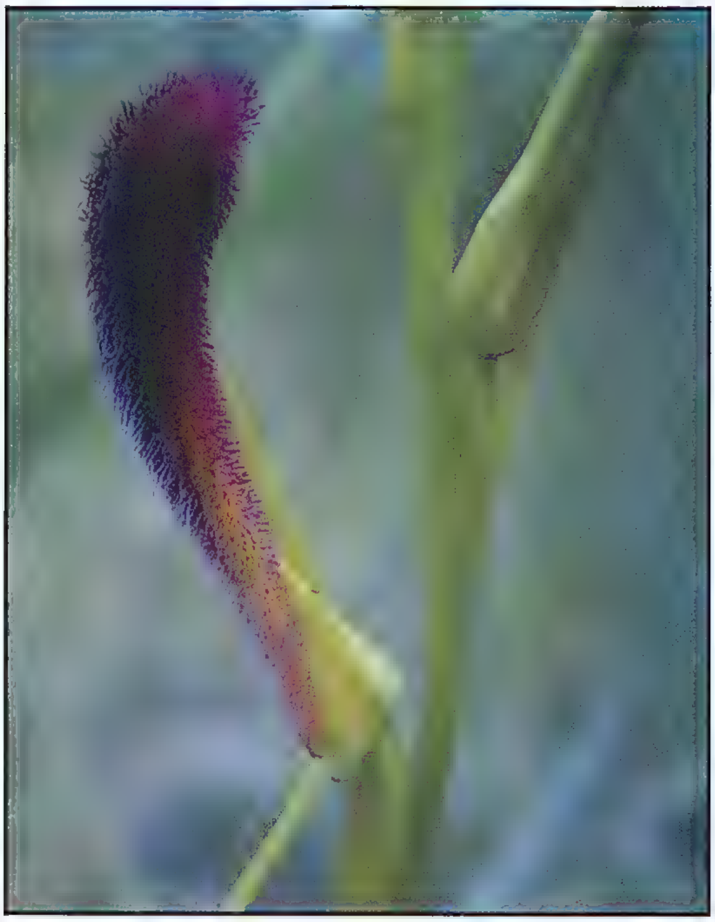


Plate 1 Leafless Tongue Orchid *Cryptostylis hunteriana*

Methods

Locations of known populations of the Leafless Tongue Orchid were extracted from a range of sources for each state, but principally from databases maintained by State and Federal government conservation agencies. Field sampling was undertaken at as many locations as possible, with the exception of records older than 30 years due to uncertainties in positional accuracy. At each population site, floristic sampling was completed within 0.04 ha sample plots (nominally 20 x 20 m), where estimated cover abundance data was scored for all vascular plant species based on modified Braun-Blanquet cover abundance scores (1–6 scale) (Braun-Blanquet 1928). Some pre-existing data was already available from previous studies (including Bell 2001; Clarke et al 2004), however only some of these studies collected cover abundance data. Consequently, prior to numerical analysis, all data were transformed into presence-absence format so that existing samples could be incorporated. Two routines in PRIMER (Plymouth Routines in Multivariate Ecological Research: Clarke & Gorley 2006) were used to elucidate apparent vegetation communities or habitat groups for occurrences of the Leafless Tongue Orchid for this study. Cluster analysis and non-metric multidimensional scaling (nMDS) on the combined dataset were performed, and diagnostic species lists for each defined floristic group generated. Plant nomenclature for sites in NSW followed Harden (1990–1993), Harden & Murray (2000) and revisions accepted by the National Herbarium of New South Wales. South-eastern Queensland taxonomy follows Stanley & Ross (1986), while Foreman & Walsh (1993) and Walsh & Entwistle (1994, 1996, & 1999) were the authorities for Victoria. In the rare cases where recognized synonyms operate in adjacent States for the one taxon, nomenclature for New South Wales was accepted. Without floristic data from areas immediately surrounding known Leafless Tongue Orchid sites, there is a risk that vegetation communities described would lack local context. However, as the purpose of this study was to describe and map known habitat of the Leafless Tongue Orchid, this was not considered a major hindrance to the project's overall aims.

Results

Figure 1 shows the location of sample plots supporting populations of *Cryptostylis hunteriana* where full floristic sampling was undertaken. Analysis of 108 sample plots and 660 native plant taxa (weeds were excluded from the analysis) resulted in the definition of 17 major groups, with one additional group added from anecdotal notes. As far as possible, data collection was completed by the same observers to reduce variability in preparing an inventory of co–occurring species. However, this approach was not always applicable where orchid populations occurred on private lands, and data collected previously by other persons was required. Figure 1 shows the predictive distribution for Leafless Tongue Orchid *Cryptostylis hunteriana*.

Conclusion

Given the rate of species extinction and habitat loss in Australia, there is an urgent need for land managers and consent authorities to understand preferred habitat for rare plant species, and especially cryptic species. The default assumption of most environmental impact assessments is that species that are present will be detected during surveys or, where not recorded, that the site represents low quality habitat for the species. However, a growing body of evidence recognises that this is not the case, either because an observer fails to detect a species that is present at a particular survey location or the growing habits of the plant make it impossible to detect for most of the year. Predictive modelling of potential habitat allows land managers to be better informed on the locations in which cryptic and rare species are likely to occur.

Ten of the eighteen defined floristic groups are based on single samples only, which may be considered outliers within the larger dataset. While the authenticity of these Leafless Tongue Orchid records are not disputed, their occurrences in otherwise unreported habitats raises questions regarding habitat variations associated with this species. The validity of records in three of these groups (communities 12–14) is further questioned due to uncertainties associated with the precision of spatial data and the accuracy ascribed to the data as held by relevant authorities.

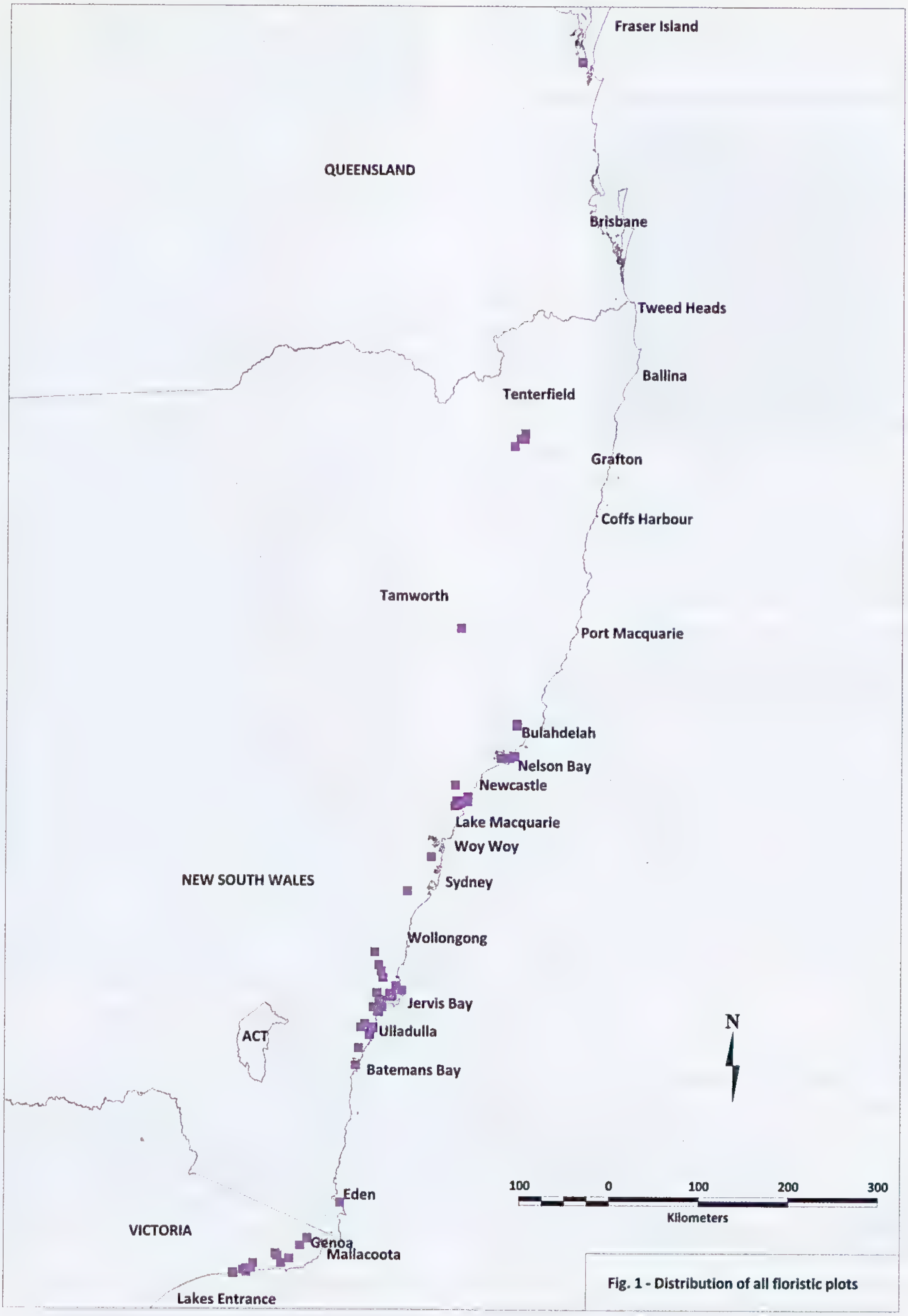
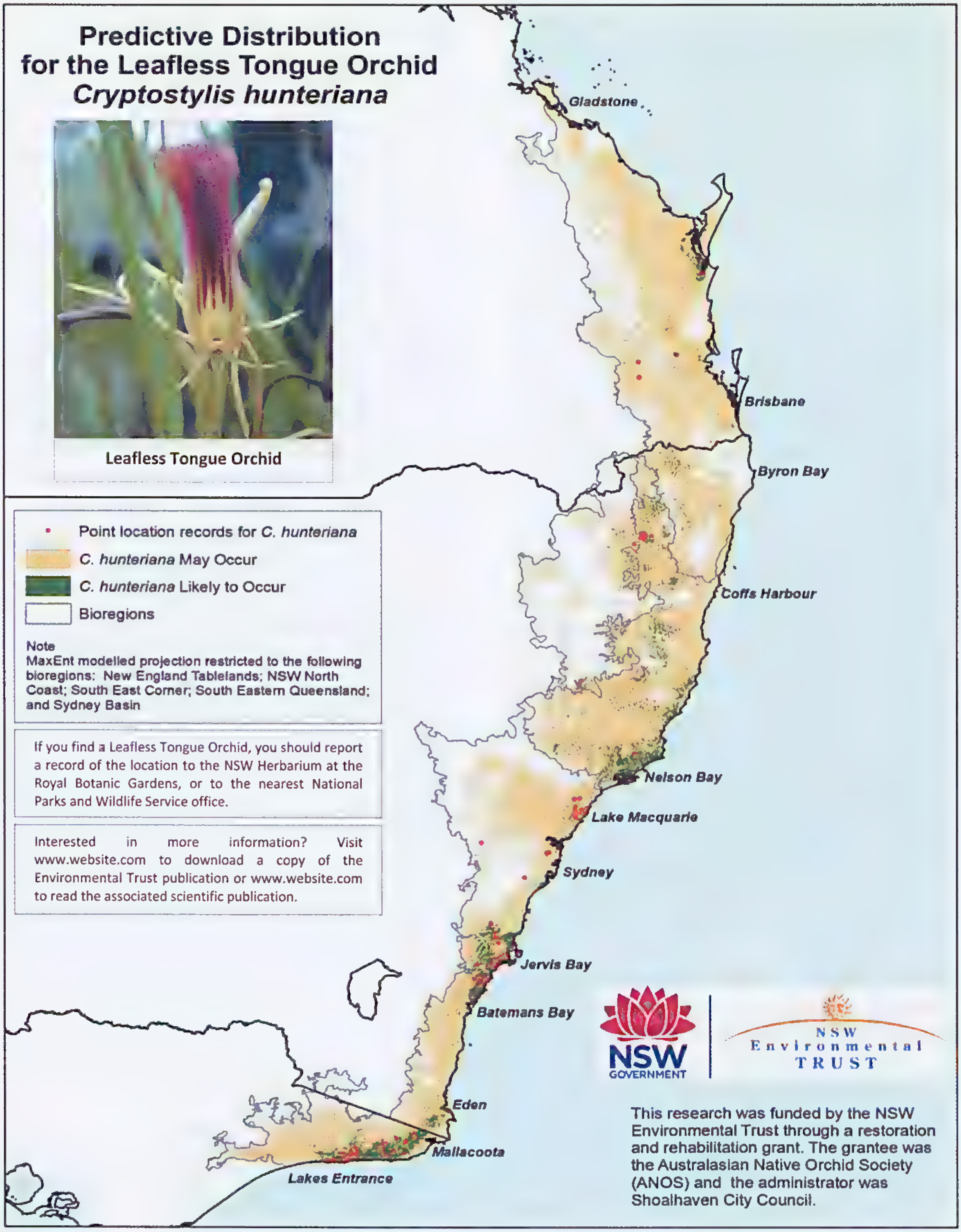


Figure 1 *Distribution of all survey locations where floristic data was collected.*


Predictive Distribution for the Leafless Tongue Orchid *Cryptostylis hunteriana*

Leafless Tongue Orchid

- ● Point location records for *C. hunteriana*
- 🟧 *C. hunteriana* May Occur
- 🟩 *C. hunteriana* Likely to Occur
- ☐ Bioregions

Note
MaxEnt modelled projection restricted to the following bioregions: New England Tablelands; NSW North Coast; South East Corner; South Eastern Queensland; and Sydney Basin

If you find a Leafless Tongue Orchid, you should report a record of the location to the NSW Herbarium at the Royal Botanic Gardens, or to the nearest National Parks and Wildlife Service office.

Interested in more information? Visit www.website.com to download a copy of the Environmental Trust publication or www.website.com to read the associated scientific publication.

This research was funded by the NSW Environmental Trust through a restoration and rehabilitation grant. The grantee was the Australasian Native Orchid Society (ANOS) and the administrator was Shoalhaven City Council.

Figure 2. The predictive distribution for Leafless Tongue Orchid *Cryptostylis hunteriana*

These groups should be treated with a lower confidence than the other defined groups. Brief summaries of the eighteen vegetation communities supporting the Leafless Tongue Orchid in Australia are included in the following text:

1. Banksia/ Mahogany Wallum Heath (QLD)

Description: Low open woodland or Wallum heath on coastal sands in the Fraser Island hinterland of southeast Queensland. Scattered low trees of Wallum Banksia (*Banksia aemula*) and Bastard Mahogany (*Eucalyptus umbra*) over a diverse range of shrubs and sub-shrubs. A common vegetation type along the eastern Australian coastline. Most *Cryptostylis* plants observed along the side of an earthern culvert at the time of field sampling, which had also been subject to recent fire. **Confidence:** High (*Cryptostylis hunteriana* observed during field sampling). **Elevation Range:** 10 m ASL. **Geology:** Pleistocene Sands. **Regional Veg Types:** *Banksia aemula* Woodland on Dunes and Sand Plains (RE 12.2.9: Neldner et al. 2005) and/ or *Banksia aemula* Woodland on Alluvial Plains near Coast (RE 12.3.14: Neldner et al. 2005).

2. New England Blackbutt Grassy Forest (NSW)

Description: Open forest on steep volcanic sediments in the Nowendoc area of the Northern Tablelands, New South Wales. Canopy dominated by New England Blackbutt (*Eucalyptus campanulata*) over a sparse to–dense shrub layer of *Bursaria longisepala, Leucopogon lanceolatus, Monotoca scoparia* and *Podolobium ilicifolium*, and an open grassy ground layer. **Confidence:** Medium (previous record of *Cryptostylis hunteriana* reliable) but no plants located during field investigations. **Elevation Range:** 1226 m ASL **Geology:** Tertiary Basalt. **Regional Veg Types:** Dry Open New England Blackbutt (FE41: NSWNPWS 1999).

3. New England Blackbutt Shrubby Forest (NSW)

Description: Steep open riparian forest at high elevation in the Nymboida National Park, Northern Tablelands of New South Wales. Canopy layer dominated by New England Blackbutt (*Eucalyptus campanulata*), and to a lesser extent Tallowwood (*Eucalyptus microcorys*) and Blue Mountains Mahogany (*Eucalyptus notabilis)*, over a dense smaller tree layer of Black She-oak (*Allocasuarina littoralis*). A moderately dense shrub layer of Black Wattle (*Callicoma serratifolia*), Ti-tree (*Leptospermum trinervium, L. polygalifolium*) and Saw-sedge (*Gahnia sieberiana*), *Lepidosperma elatius* and *Schoenus melanostachys.* Original record reliable (specimen lodged at North Coast Regional Botanic Gardens, Specimen No 28333). Notes accompanying original collection state that *Cryptostylis hunteriana* occurred on a lower slope/stream bank. Confidence: High (*Cryptostylis hunteriana* observed during field sampling). Elevation Range: 930 m ASL. Geology: Granite. Regional Veg Types: Moist Escarpment New England Blackbutt (FE88: NSWNPWS 1999).

4. Large-fruited Blackbutt/ Strawberry Gum Woodland (NSW)

Description: Open forest or heathy woodland at high elevations on granite, on the northern Tablelands of New South Wales. Canopy dominated by Large-fruited Blackbutt (*Eucalyptus pyrocarpa*), with other species including Strawberry Gum (*Eucalyptus olida*) and *Eucalyptus williamsiana*. A diverse shrub layer including several granitic endemics is present, and rocky outcrops of Permian–aged granites are common. Confidence: High (*Cryptostylis hunteriana* observed during field sampling). Elevation Range: 1000–1100 m ASL. Geology: Permian Granites. Regional Veg Types: Dry Heathy New England Stringybarks (FE39: NSWNPWS 1999); *E.olida–E. ligustrina–E.cameronii* Forest/ Woodland (Hunter & Sheringham 2008); *E.olida–E.pyrocarpa–E.planchoniana* Forest/Woodland (Hunter & Sheringham 2008).

5. Scribbly Gum/ Bloodwood/ Apple Woodland (NSW)

Description: Heathy woodland on gently undulating topography on the Lake Macquarie lowlands in northern parts of Wyong LGA and the southern parts of Lake Macquarie LGA, New South Wales. Scattered canopy species include Broad-leaved Scribbly Gum (*Eucalyptus haemastoma*), Red Bloodwood (*Corymbia gummifera*), Charmhaven Apple (*Angophora inopina*) and Brown Stringybark (*Eucalyptus capitellata*). *Cryptostylis hunteriana* typically present as single flowering spikes or in small groups **Confidence:** High (*Cryptostylis hunteriana* observed during field sampling). **Elevation Range:** 30 – 60 m ASL. **Geology:** Triassic Narrabeen series. **Regional Veg Types:** Coastal Plains Scribbly Gum Woodland (MU31: NSWNPWS 2000).

6. Bloodwood/ Apple/ Mahogany/ Peppermint Forest (NSW)

Description: Open forest on Permian or Carboniferous sediments of the Central Coast of New South Wales, on low hills in close proximity to the coast. Known areas include Catherine Hill Bay (Lake Macquarie LGA), Nelson Bay (Port Stephens LGA) and Bulahdelah (Great Lakes LGA). Canopy composition can vary, but commonly includes Smooth-barked Apple (*Angophora costata*), Red Bloodwood (*Corymbia gummifera*) and Bastard Mahogany (*Eucalyptus umbra*). At Bulahdelah, other associates include Sydney Peppermint (*Eucalyptus piperita*), Blackbutt (*Eucalyptus pilularis*) and Forest Oak (*Allocasuarina torulosa*), while Brown Stringybark (*Eucalyptus capitellata*) is also present at Catherine Hill Bay. Large to very large populations of *Cryptostylis hunteriana* present in this habitat type. Variation in habitat includes moderately tall open forest on sediments and low coastal open forest on sediments and volcanics. **Confidence:** High (*Cryptostylis hunteriana* observed during field sampling). **Elevation Range:** 30 – 110 m ASL. **Geology:** Permian Newcastle Coal Measures; Permian Bulahdelah Formation; Carboniferous Volcanics. **Regional Veg Types:** Nerong Smooth-barked Apple Forest (MU32: NSWNPWS 2000); Coastal Headland Complex (MU51: NSWNPWS 2000); (?) Dry Heathy Sandstone Blackbutt (FE40: NSWNPWS 1999).

7. Dwarf Apple/ Banksia Scrub (NSW)

Description: Scrub to heath on a broad plateau in Garigal National Park, Sydney. A tall shrub layer is dominated by Dwarf Apple (*Angophora hispida*) and Heath-leaved Banksia (*Banksia ericifolia*), with a diverse low shrub layer including *Darwinia fascicularis* and a range of Ericaceae and Proteaceae taxa, and a sparse groundcover layer composed mostly of species from the Cyperaceae and Restionaceae. One record at this site, with an additional (historic) record further north in Ku-ring-gai Chase National Park, in a similar vegetation unit. **Confidence:** Medium (previous record of *Cryptostylis hunteriana* reliable, but not seen at time of survey). **Elevation Range:** 150 m ASL. **Geology:** Triassic Hawkesbury

Sandstone. **Regional VegTypes:** Dwarf Apple Scrub (MU28a: NSWNPWS 2000); Hinterland Sandstone Dwarf Apple Heath-Woodland (S_HL10: NSW DECCW 2010).

8. Grey Gum/ Bloodwood/ Stringybark Forest (NSW)

Description: Open forest or woodland on a broad ridge on the western side of the Georges River, in Georges River Nature Reserve, Sydney. Typical canopy species are Grey Gum (*Eucalyptus punctata*), Red Bloodwood (*Corymbia gummifera*) and Narrow-leaved Stringybark (*Eucalyptus sparsifolia*), above a diverse shrub stratum of various Proteaceae, Fabaceae and Ericaceae shrubs, with a groundcover stratum of Wiry Panic (*Entolasia stricta*), Kangaroo Grass (*Themeda australis*) and *Cyathochaeta diandra*. **Confidence:** Low (*Cryptostylis hunteriana* record reliable but precise location uncertain). **Elevation Range:** 100–120 m ASL. **Geology:** Triassic Hawkesbury Sandstone (Mittagong Formation). **Regional Veg Types:** Hinterland Sandstone Transition Grey Gum Forest (S_DSF18: NSW DECCW 2010); Upper Georges River Sandstone Woodland (MU32: Tozer 2003).

9. Banksia/ Hakea Wet Heath (NSW)

Description: Wet heath of *Banksia ericifolia* and *Hakea teretifolia* with a groundcover of dense sedge species form the Cyperaceae (*Lepidosperma, Chorizandra, Schoenus*) and Restionaceae (*Empodisma, Lepyrodia, Leptocarpus*). One site only, occurring on gently-sloping but poorly-drained site in the Vincentia – Erowal Bay area, on the Shoalhaven Plain of New South Wales. Positional accuracy of this site in question. **Confidence:** Low (*Cryptostylis hunteriana* record reliable but precise location uncertain) **Elevation Range:** 15 m ASL. **Geology:** Undifferentiated (unknown – alluvium, gravel, swamp deposits and sand dunes). **Regional Veg Types:** Northern Coastal Tall Heath (VG140: Gellie 2005).

10. Peppermint/Bloodwood/ Stringybark/Silvertop Ash Forest (NSW)

Description: Open forest with a shrubby understorey on shallow soils on low ridges and dry slopes in coastal foothills of the Shoalhaven Plain, New South Wales [also occurs in Eden area (Keith & Bedward 1999)]. Common upper canopy species are Sydney Peppermint (*Eucalyptus piperita*), White Stringybark (*Eucalyptus globoidea*) and Red Bloodwood (*Corymbia gummifera*). All records of *Cryptostylis hunteriana* in this Group occur as individual plants or small groups. **Confidence:** High (*Cryptostylis hunteriana* observed during field sampling). **Elevation Range:** 65–120 m ASL. **Geology:** Permian (Shoalhaven Group/ Snapper Point), Ordovician (Adaminaby Group). **Regional Veg Types:** South Coast Lowland Dry Shrub Forest (VG2: Gellie 2005).

11. Bloodwood/ Scribbly Gum/ Silvertop Ash Forest (NSW)

Description: Heathy woodland to open forest on gentle rolling slopes and plains, on sedimentary Permian landscapes of the Shoalhaven coastal plain, New South Wales. This community occurs as a mosaic of woodland and scrub-heath forms throughout the northern coastal plain in the Shoalhaven LGA: these two forms may (given the similarities in floristic composition) be more developed or more disturbed forms of the same community. High abundance of records of *Cryptostylis hunteriana* occur in both forms, as both individual plants or large populations. Typical canopy species are Red Bloodwood (*Corymbia *gummifera*) and Hard-leaved Scribbly Gum (*Eucalyptus sclerophylla*) with occasional Silver-top Ash (*Eucalyptus sieberi*), and occasional small trees of Black She-oak (*Allocasuarina littoralis*), above a diverse heathy understorey. **Confidence:** High (*Cryptostylis hunteriana* observed during field sampling). **Elevation Range:** 30–160 m ASL. **Geology:** Shoalhaven Group (Wandrawandian Siltstone, Snapper Point, Nowra Sandstone). **Regional Veg Types:** Northern Coastal Hinterland Heath Shrub Dry Forest (VG139: Gellie 2005).

12. Silvertop Ash Forest/ Yertchuck/ Spotted Gum Forest (NSW)

Description: Open forest on the south coast of New South Wales, supporting a canopy of Silver-top Ash (*Eucalyptus sieberi*) with Yertchuk (*Eucalyptus consideniana*) and Spotted Gum (*Corymbia maculata*), a middense small tree layer of Black She-oak (*Allocasuarina littoralis*) and a shrub layer of *Dillwynia sieberi* and *Pultenaea retusa,* above a groundcover of grasses (predominantly Wiry Panic *Entolasia stricta*), sedges (*Cyathochaeta, Lepidosperma*) and various graminoids (*Lomandra*). One plant found in January 2008 in this community near Batemans Bay; sampling plot was centred on this record. **Confidence:** High (*Cryptostylis hunteriana* record reliable). **Elevation Range:** 10 m ASL. **Geology**: Ordovician (Wagonga Group). **Regional Veg Types:** Coastal Lowlands Cycad Dry Shrub Forest (VG 9: Gellie 2005).

13. Woollybutt/Bangalay/ Stringybark/Roughbark Apple Forest (NSW)

Description: Low open forest on a coastal headland in Ben Boyd National Park, southern New South Wales, with a canopy dominated by Bangalay (*Eucalyptus botryoides*) and Woollybutt (*Eucalyptus longifolia*), above a small tree layer of Black She-oak (*Allocasuarina littoralis*) and Hickory (*Acacia implexa*), and a groundcover layer of sedges (*Gahnia radula*), graminoids (*Lomandra* spp., *Dianella, Patersonia*) and various herbs and twiners. Positional accuracy may be in question for this record. *Cryptostylis hunteriana* not detected during plot data collection. **Confidence:** Low (*Cryptostylis hunteriana* record reliable but precise location uncertain). **Elevation Range:** ~40 m ASL. **Geology:** Devonian (Merimbula Group, Ben Boyd Formation). **Regional Veg Types:** Lowland Gully Shrub Forest (MU 37, Keith & Bedward 1999); South-East Lowland Gully Shrub Forest (WSF e37: Tozer et al. 2010).

14. Spotted Gum/ Woollybutt/ Paperbark Forest (NSW)

Description: Open forest of Spotted Gum (*Corymbia maculata*) and Woollybutt (*Eucalyptus longifolia*) above a small tree layer of White Feather Honeymyrtle (*Melaleuca decora*) and Black She-oak (*Allocasuarina littoralis*), on the Shoalhaven Plain of New South Wales. A sparse shrub layer includes *Daviesia ulicifolia, Pultenaea villosa* and Ball Honeymyrtle (*Melaleuca nodosa*). A sparse groundcover includes grasses (*Entolasia, Aristida*), herbs (*Brunoniella, Goodenia*) and graminoides (*Lomandra*). Positional accuracy under question: this is an unusual vegetation community for *Cryptostylis hunteriana* in the Shoalhaven, and the species was not detected during plot data collection. **Confidence:** Low (*Cryptostylis hunteriana* record reliable but precise location uncertain). **Elevation Range:** ~50 m ASL. **Geology:** Permian (Shoalhaven Group – Berry Siltstone). Regional Veg Types: Jervis Bay Lowlands Dry Shrub-Grass Forest (VG 5: Gellie 2005); Currambene–Batemans

Lowlands Forest (DSF p85: Tozer et al. 2010).

15. Coachwood/ Lily Pily/ Bangalay Rainforest (NSW)

Description: One site located on the south coast of New South Wales, in a gully with forest of *Eucalyptus botryoides* and a closed mesic small tree layer, including Coachwood (Ceropetalum apetalum), Lily Pily (*Acmena smithii*), *Hedycarya angusifolia* and *Acacia maidenii*. Common understorey species include *Synoum glandulosum* subsp. *glandulosum*, Bolwarra (*Eupomatia laurina*), *Sticherus flabellatus* var. *flabellatus* and Gristle Fern (*Blechnum cartilagineum*). Positional accuracy of the record is questionable. **Confidence:** Low (previous record of *Cryptostylis hunteriana* reliable). **Elevation Range:** 130 m ASL. **Geology:** Permian (Shoalhaven Group – Snapper Point Formation). **Regional Veg Types:** Coastal Hinterland Ecotonal Gully Rainforest (VG 20: Gellie 2005).

16. Banksia/ Hakea Dry Scrub-Heath (NSW)

Description: Tall heath 1–2m with patches of dense scrub to 3–4m, on sedimentary Permian landscapes on the northern coastal Plain of the Shoalhaven, New South Wales. Structure varies from low damp heath (*Banksia ericifolia* and *Hakea teretifolia*) to drier heath-scrub (*Lambertia formosa, Hakea laevipes* and various Epacrids), to dense scrub (*Banksia ericifolia*). Occasional stunted canopy species are *Corymbia gummifera* and *Eucalyptus sclerophylla.* This and community 11 (see above) occur as a mosaic of often intergrading forms throughout the coastal plain in the northern Shoalhaven LGA, and may (given the similarities in floristic composition) be more developed or more disturbed forms of the same community. High abundance of records of *Cryptostylis hunteriana* occur in both communities, as both individual plants or large populations. Note that this group has not been included in numerical analyses. **Confidence:** High (*Cryptostylis hunteriana* observed during field sampling). **Elevation Range:** 15–150 m ASL. **Geology:** Shoalhaven Group □ Wandrawandian Siltstone or Snapper Point Formation. **Regional Veg Types:** Northern Coastal Tall Heath (VG 140: Gellie 2005).

17. Yertchuck/ Stringybark Woodland (VIC)

Description: Open forest or modified open forest (along slashed powerline easements) on gently undulating topography in the East Gippsland area of Victoria. Dominated in the canopy by Gippsland Peppermint (*Eucalyptus croajingolensis*), Yertchuck (*Eucalyptus consideniana*) and Stringybarks (*Eucalyptus globoidea, Eucalyptus baxteri*). Understorey vegetation tends to be open, although in some locations dense stands of *Melaleuca squarrosa* and *Leptospermum* spp are evident. Some locations support dense shrub layers of *Melaleuca squarrosa* and *Leptospermum trinervium*, over a moist ground layer including sedge species and ferns, which differs from the more typical open forest with a heathy understorey. **Confidence:** High (*Cryptostylis hunteriana* observed during field sampling). **Elevation Range:** 35–120 m ASL. **Geology:** Cainozoic (undifferentiated consolidated sedimentary rocks); Devonian (Tonghi Granodiorite). **Regional Veg Types:** Banksia Woodland (EVC14: Davies et al. 2002); and/ or Lowland Forest (EVC16: Davies et al. 2002); Timbillica Dry Shrub Forest (MU46A: Keith & Bedward 1999).

18. Grasstree Wet Heath (VIC)

Description: Open heath in broad depressions on lowlands of the East

Gippsland region in Victoria, often dominated by Grasstree (*Xanthorrhoea resinosa*) and sedge/ grass species. Small trees, Saw Banksia (*Banksia serrata*) and Yertchuck (*Eucalyptus consideniana*) may be present as widely scattered individuals. Some locations (e.g. Cape Conrad) support little or no *Xanthorrhoea resinosa*, but are instead dominated by *Allocasuarina paludosa* and other heath species. **Confidence:** High (*Cryptostylis hunteriana* observed during field sampling). **Elevation Range:** 30m–200 m ASL. **Geology:** Quaternary sands, Cainozoic (undifferentiated consolidated sedimentary rocks), Emsian (Yeerung Volcanics), Devonian (Tonghi Granodiorite), Ordovician (Adaminaby Group, Holocene alluvium. **Regional Veg Types:** Clay Heathland (EVC7: Davies et al. 2002); and/ or Wet Heathland (EVC8: Davies et al. 2002); Coastal Lowland Heath (MU55: Keith & Bedward 1999).

Discussion

The Leafless Tongue Orchid occupies a wide range of habitat types throughout its known distributional range. Floristically, the species has been recorded from high elevation grassy forests on Tertiary basalt, through a range of open forests and heathy woodlands on various sedimentary geologies, to wet heaths and wallum scrubs on Quaternary sands. This range of habitats extends from elevations of 10 m ASL in south-eastern Queensland, to over 1200 m ASL at Nowendoc National Park (NSW Northern Tablelands). The Shoalhaven area of New South Wales still appears to be a stronghold for the species, with data collected from 59 locations, with East Gippsland (17) and Lake Macquarie (16) the next most populous regions. The largest recorded populations occur in New South Wales at Bulahdelah (Bulahdelah State Forest and private land), in the Shoalhaven (mostly on private land) and in Port Stephens (within Tomaree National Park). Protected populations of the Leafless Tongue Orchid are known from Gibraltar Range, Washpool, Nowendoc, Nymboida, Tomaree, Wallarah, Blue Mountains, Ku-ring-gai Chase, Jervis Bay, Jervis Bay Nature Reserve, Conjola, Meroo, Murramurrang and Ben Boyd National Parks in New South Wales; and Croajingolong National Park, Cape Conran Coastal Park and William Hunter Flora Reserve in Victoria.

For a cryptic plant species which is rarely encountered during field surveys, the Leafless Tongue Orchid is represented within a surprising number of habitat types across an extensive geographical distribution. One of the aims of this study was to identify those vegetation communities that have been shown to support populations of the species throughout its full geographic range. For practical application, it is sensible to equate these defined communities with existing regional vegetation classifications, so that the findings of this study can be readily applied to management and decision making at finer scales. Pre-existing classifications of native vegetation within regions and in all three states vary extensively in the level of detail presented, and because of this it has not been possible to apply a consistent classification for all populations across all states.

A number of limitations have become evident throughout the course of this project, including issues relating to the comprehensiveness of data obtained from a number of sources. The age of some records, and their poor location accuracy (to only 200 m or worse), may mean that field data collected at the locations of these older records may not accurately reflect the floristics of the actual locations of these Leafless Tongue Orchid populations. This limitation gives rise to particular difficulties of assigning correct habitat types in landscapes with high degrees of habitat variability within limited spatial ranges (e.g. in the NSW Central Coast and in the Shoalhaven regions).

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Photos© by Alan Stephenson, Stephen Bell, Steve Chamberlain and Claire deLacey unless otherwise indicated.

Further Information

This article is a summary of research into the habitat types known to support the Leafless Tongue Orchid in Queensland, New South Wales and Victoria. For details of the study, a fact sheet is available at: http://www.environment.nsw.gov.au/resources/grants/criticalplants.pdf. A more detailed paper, including the results of predictive mapping, has been submitted to the ecology journal *Cunninghamia* (deLacey et al) which will be published in the near future.

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RHS Registrations of Australian Hybrids

Feb-Apr 2012

Bulbophyllum

Ochre Arches	*bracteatum* x *elisae*	G Walsh 2011

Dendrobium

David Furey	Elegant Heart x Hastings	Down Under N.O. (O/U) 2012
Yarra Moon	*kingianum* x Jesmond Gem	P. & S .Adams 2012
Yarra Quartz	Les Adams x Yondi	P. & S .Adams 2012
Yarra Star	David Adams x *speciosum*	P. & S .Adams 2012

Dendrobium [*Dockrillia*]

Jake Noah	*striolatum [striolata]* x *dolichophyllum* [*dolichophylia*]	S.Harper 2012

Sarcochilus

Harold	Heidi x *australis*	P. & S .Adams 2012
Piccaninny	Bunyip x Kirra-Lea	Westen Orchids. 2012

RHS Registrations of Australasian Hybrids

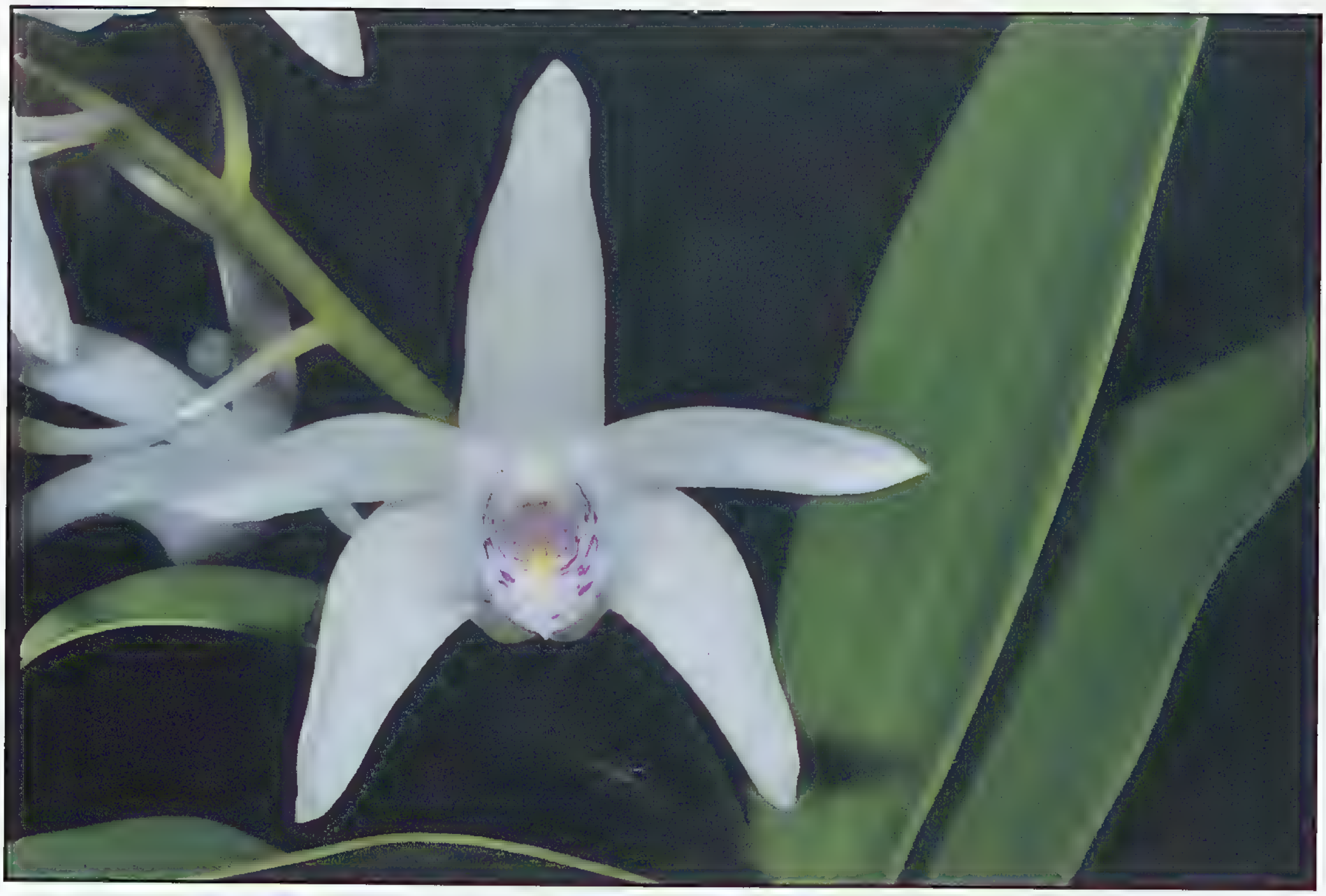
Feb-Apr 2012

Dendrobium

Memoria Stephen Martin	*tangerinum* x *carronii*	G.Martin (Coleman's) 2012

Dendrobium [*Dockrillia*]

Allison	Saboteur x *erythraeum* [*hepatica*]	R.J.Bennett (S.Harper) 2012
Dorn's Bill	Fay Moore x *fuliginosum* [*fuliginosa*]	G.Dimos (W.Skillicorn) 2012
Hamlyn Double Helix	Tan Chye Siam x *helix*	Claude Hamilton (O/U) 2012
Kalon Byrne-Dimos	Dorn's Bill x Grumpy	G.Dimos 2012
Mango Tango	Peaches and Cream x Nalo Blush	Puanani 2012
Mikawa Flake	Mini Snowflake x *atroviolaceum*	G.Kinbara 2012
Reptilian	Green Elf x *shiraishii*	T.Bielecki (R.Tokunaga) 2012
Waverley Amber	Grumpy x Dainty Cascades	S.Harper 2012
Waverley Flare	*striolatum* [*striolata*] x Grumpy	S.Harper 2012
Waverley Gem	Grumpy x *mortii*	S.Harper 2012
Waverley Glow	Aussie Phil x Australian Luscious Lip	S.Harper 2012
Waverley Jewel	Saboteur x *striolatum* [*striolata*]	S.Harper 2012
Waverley Magic	Saboteur x Australian Sunblessed	S.Harper 2012
Waverley Mist	Martin x Fiona Louise	S.Harper 2012
Waverley Splendour	*teretifolium* x Australian Sunblessed	S.Harper 2012
Waverley Sunshine	*dolichophyllum* x Amythaon	S.Harper 2012



Dendrobium Yarra Star *D.* David Adams x *D. speciosum* Photo P Adams

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[Closed for judging b/w 11am and 12noon this day]
Sun 2nd Sept 9am to 2pm

Location: 57 Spooners Ave., Greenhill via Kempsey.

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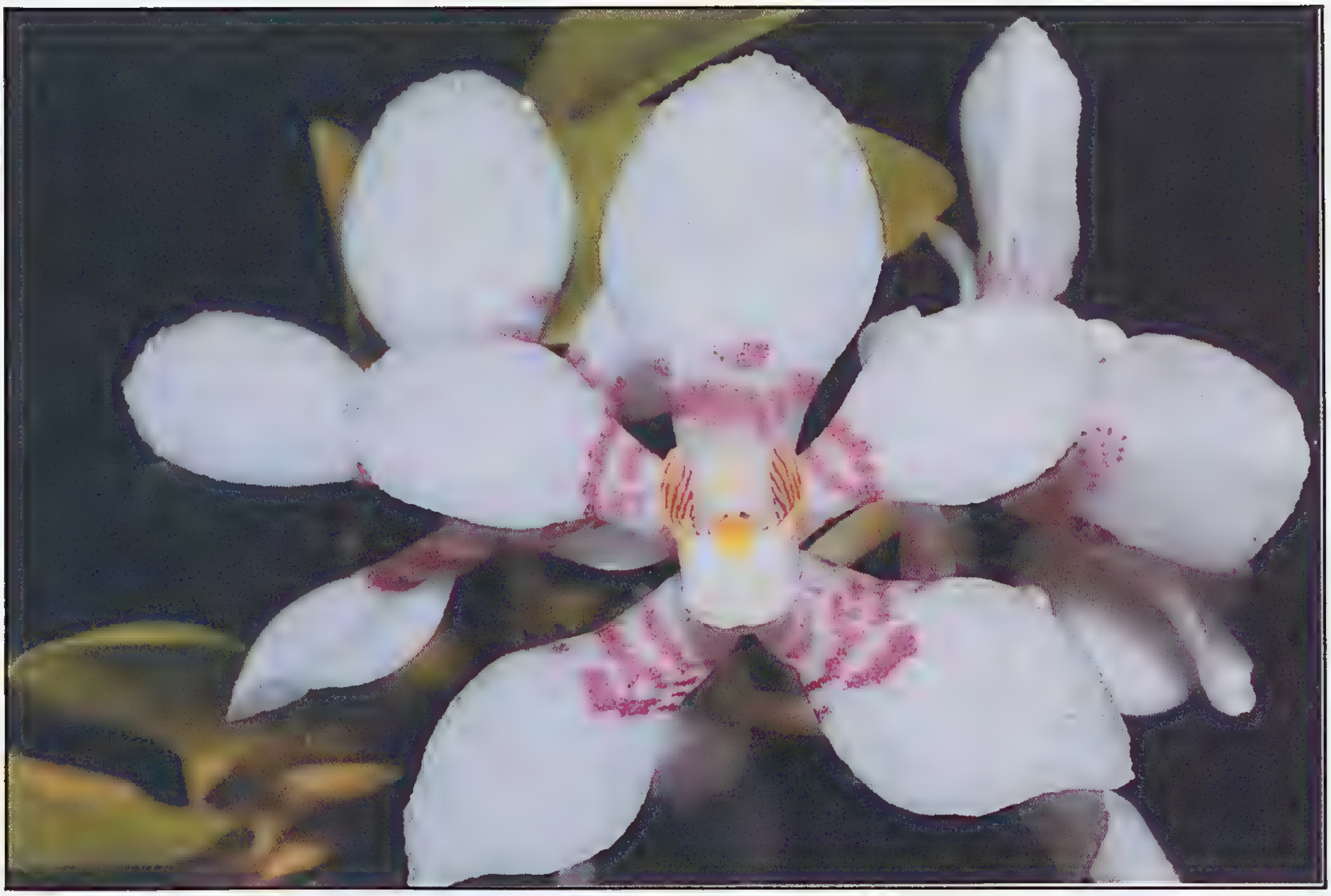
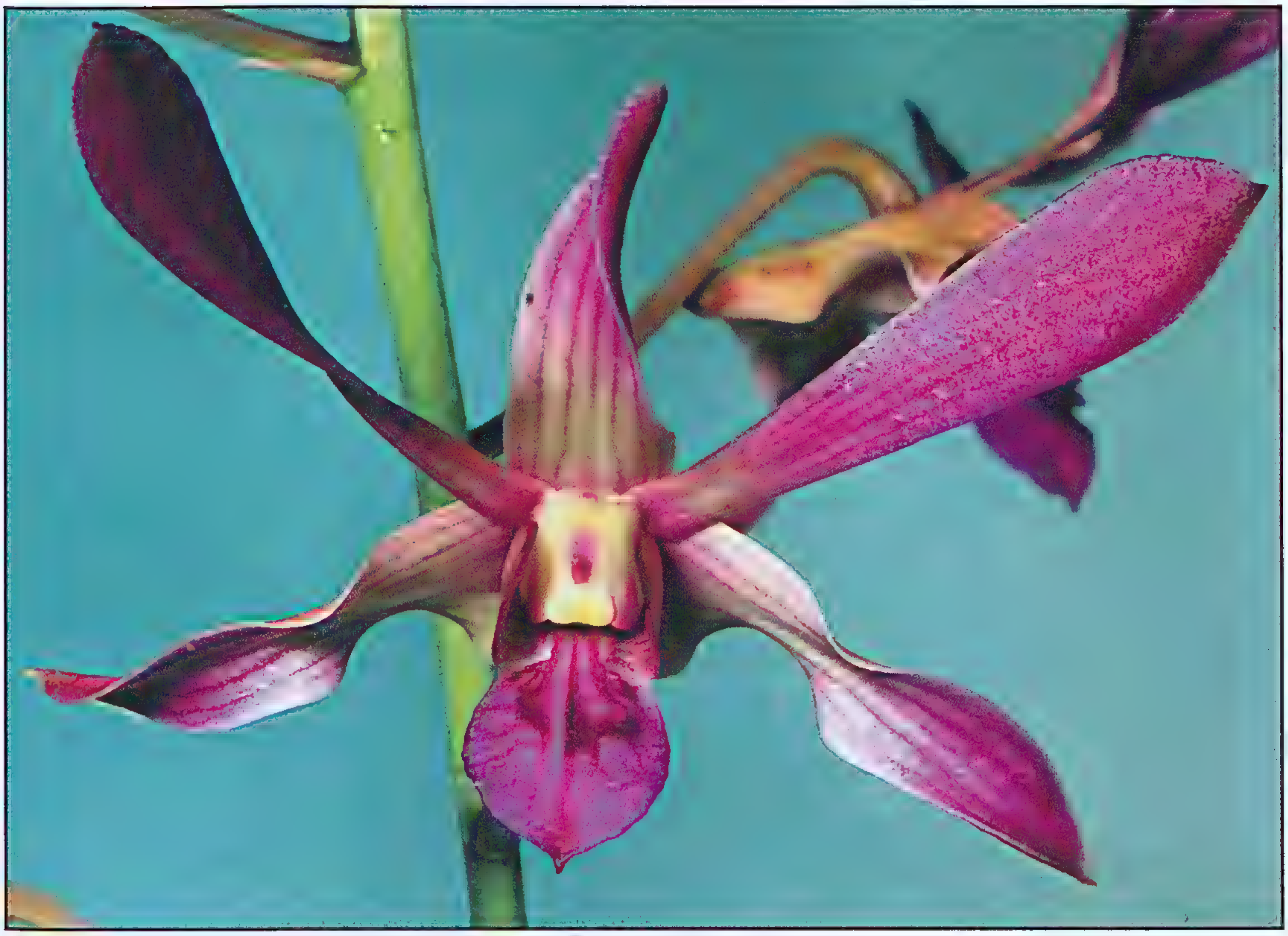
OR contact Ted Walmsley on (02) 6562-7150 or John Zietsch on (02) 6554-9733.



Sarcochilus Harold Photo P Adams



Dendrobium Magenta's Pride 'Robert' HCC/ANOS 79.3 pts Owner Robert Reitano

New Species of Papuan *Agrostophyllum* 3.

Paul Ormerod, P.O. Box 8210, Cairns 4870, Queensland.
Email: wsandave1@bigpond.com

ABSTRACT: Four species and two subspecies of Papuan *Agrostophyllum* are described and illustrated. The new taxa are *A. alticola, A. flexuosum, A. flexuosum* ssp. *peloricum, A. flexuosum* ssp. *telefominense, A. kerenganum* and *A. wagirubuanum.*

Key Words: New Guinea, *Agrostophyllum,* new species.

This paper continues on from the second part (Ormerod 2011). Studies of herbarium material indicate at least another twelve taxa (ten species, two subspecies) require description from New Guinea. There is however a number of incomplete (i.e. flowers lacking, damaged or immature) dried specimens that appear to represent new entities and it would prove to be of no surprise if several more novelties were to be described in the future.

Andre Schuiteman (K) has pointed out that he believes *A. isuaravum* Ormerod to be a synonym of *A. papuanum* Schltr. After study of more collections of this species I agree. It should be noted Schlechter (1928) supplied two drawings he called *A. papuanum,* the second one (Taf. C, no. 373) is the true species whilst the first one (Taf. C, no. 372) seems to represent an undescribed member of the *A. longifolium* (Blume) Rchb.f. complex.

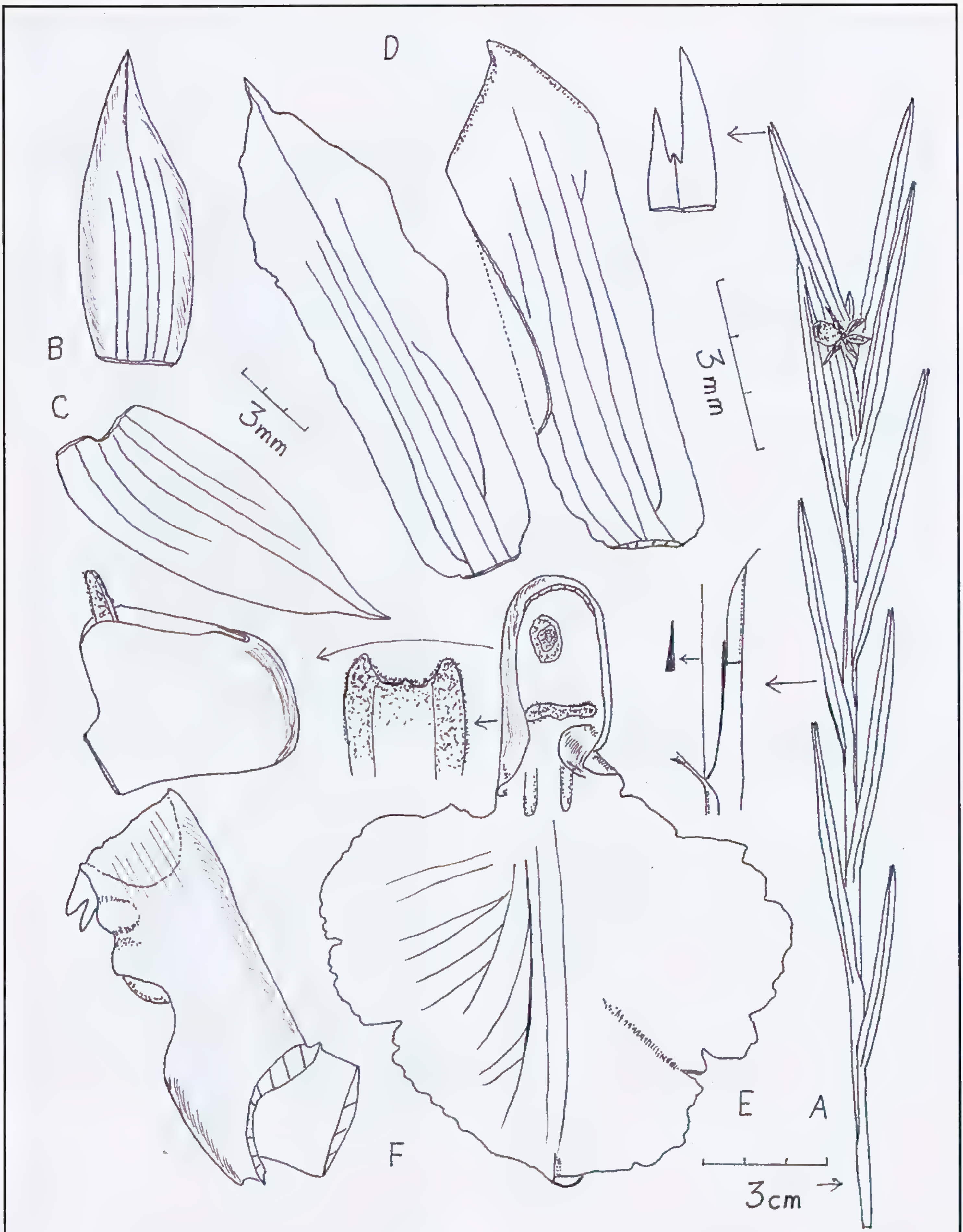
Agrostophyllum alticola Ormerod, *sp. nov.*

Type: Indonesia, Papua Prov., track from Mulalos to Habbema, 3100 m, 26 October 1992, *M. Mendum & G. Argent 92830* (Holotype: E!).

Affinis A. militare Ormerod *sed sepalis longioribus (8.9-11.2 vs. 5.8-7.0 mm) et midlobulis epichilo latioribus (5 vs. 2.0-2.9 mm) differt.*

Terrestrial herb. Rhizome and roots not seen. Stems terete basally, slightly compressed above, laxly 8-10 leaved, 14.1-22.0 cm long, ca. 0.15 cm thick basally, 0.2-0.3 cm wide across sheaths above. Leaves erect, linear, apex inequally to equally bidentate with a short deltate mucro, 48-77 mm long, 3.5-4.0 mm wide, longer tips 1.72.7 mm long, shorter tips 0.2-1.0 mm long; leaf sheaths not or sometimes black margined, exposed part ca. 30 mm long; stipules subulate, acute, 1.2-2.0 mm long. Inflorescence terminal, composed of a few bracts and sheaths, successively one flowered, to 22 mm long, 3-8 mm wide. Pedicellate ovary triquetrous, with applanate wings in upper half, 11 mm long.

Flowers white, lip with yellow spot near base. Dorsal sepal broadly oblong-lanceolate, acute, lightly carinate, 5 veined, 8.9-9.5 mm long, 3.5-3.9 mm wide. Lateral sepals obliquely ovate-lanceolate, acute, lightly carinate, 5 veined, 11.2 mm long basally (10.2-10.9 mm long medially), 4.0-4.3 mm wide. Petals oblong-ligulate, acute, 3-4 veined, 8.85-8.90 mm long, 2.50-2.75 mm wide. Labellum trilobed, 9.50-9.75 mm long; hypochile with rotundate-truncate sidelobes, ca. 3 mm long, 2.75 mm wide laterally; ligula subquadrate, apex widely and shortly bidentate, densely papillose-pubescent, raising 1 mm above sidelobes; epichile suborbicular, trilobulate, base with 2 thick oblong keels, 6.500-6.75 mm long, 7.5 mm wide, midlobule transversely semielliptic, ca. 2.0-2.3 mm long, 5 mm wide. Column stout, obliquely erect, 4.75 mm long (minus anther cap).



Agrostophyllum alticola – A. stem; B. dorsal sepal; C. lateral sepal; D. petals; E. labellum; F. column. A, BC and DEF to respective scales. Drawn from holotype.

Distribution: Indonesia (Papua Prov.). **Habitat:** Terrestrial on trackside in forest, 3100 m.

Etymology: From the Latin *altus,* high and the suffix *-cola,* a dweller, in reference to the high altitude habitat. This species is most similar to the Papua New Guinean *A. militare* Ormerod but is easily recognised by its larger flowers (sepals 8.9-11.2 vs. 5.8-7.0 mm), twice as wide labellum midlobule (5 vs. 2.0-2.3 mm) and stouter, obliquely erect column.

Agrostophyllum flexuosum Ormerod, *sp. nov.*
Type: Papua New Guinea, Morobe Prov., Menyama Subdistr., Tawa Village, near Aseki, 1400 m, 15 May 1968, *H. Streimann & A. Kairo NGF 27611* (Holotype: K!; Isotypes: A!, BO, BRI, CANB, L, LAE, SING).
Affinis A. curvilabre J.J. Sm. *sed labello rhombicis, late retusis (non flabellatis, subtruncato-emarginatis) et column semivalido-clavatis (non valido-conicis) differt.*

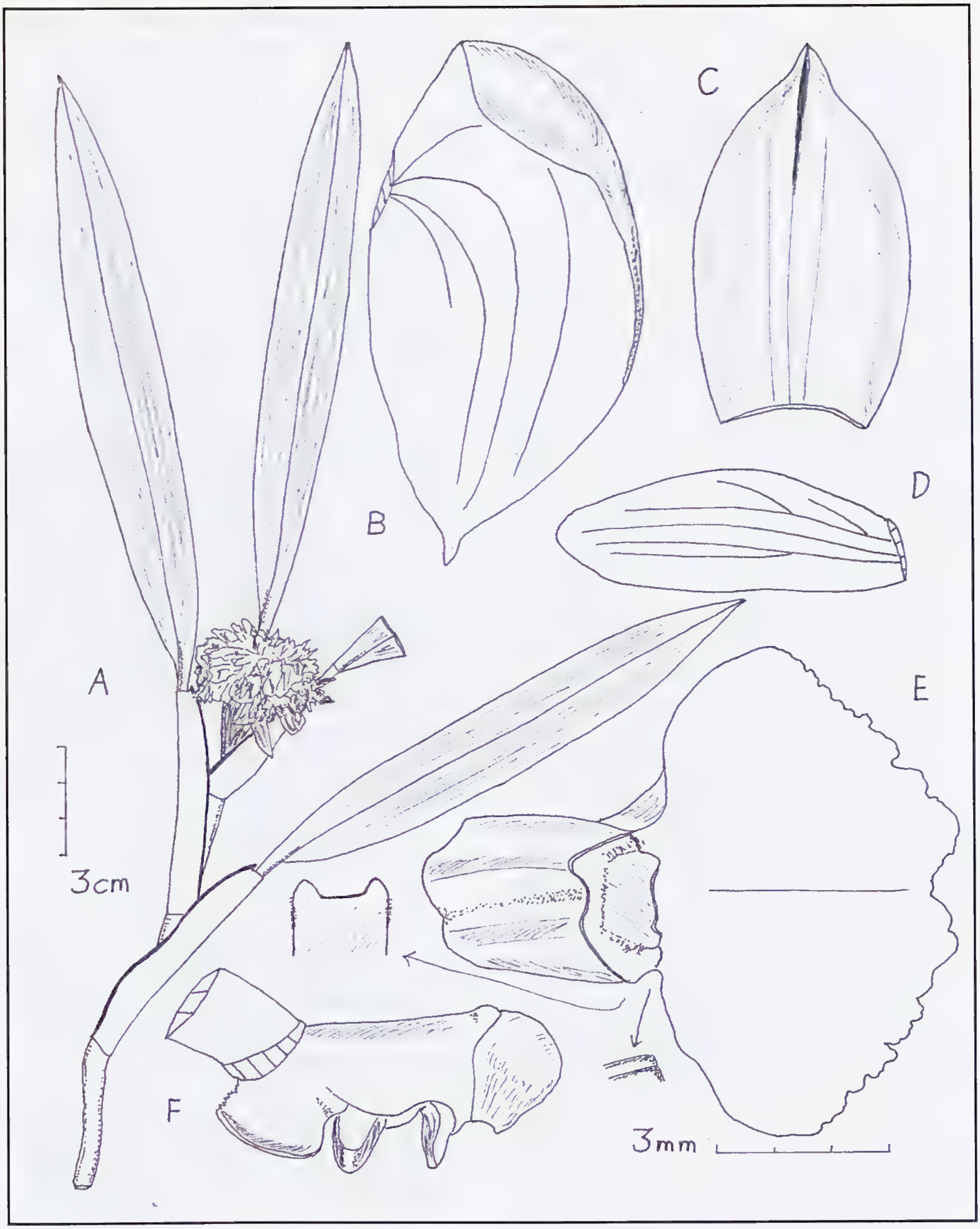
Epiphytic herb. Roots terete, to 1.3 mm thick. Stems semiterete basally, compressed above, laxly leaved, partly exposed at dorsal base of leaf sheaths to wholly enclosed by leaf sheaths, flexuous to straight, 17.0-37.5 cm long, base 0.2-0.3 cm thick, 0.6-0.9 cm wide above. Leaves ligulate, apex tridentate, dull dark green, 6.5-20.7 cm long, 1.70-2.55 cm wide; leaf sheaths black margined, exposed part 5.3-6.3 cm long, 0.85-0.95 cm wide laterally; stipules deltate, acute, to 2 mm long. Inflorescence terminal, composed of numerous bracts, sheaths and some flowers, ca. 35 mm wide; sheaths ovate, acute to 15 mm long. Pedicellate ovary terete, laxly furfuraceous, ca. 8.5 mm long. Flowers laxly furfuraceous externally, white, or with sepals pale yellow tipped whitish, petals and lip white, column yellow, anther cap pale brownish with a paler median line. Dorsal sepal ovate-elliptic, acute, 3-5 veined, carinate in apical half, 6-7 mm long, 4 mm wide. Lateral sepals obliquely ovate-elliptic, apiculate, basal quarter enclosing spur, 3-4 veined, carinate in upper third, 8.0-10.5 mm long basally (6.5-8.0 mm long along midvein), 5.0-5.1 mm wide. Petals oblong, obtuse, 3 veined, 6.0-6.5 mm long, 1.9-2.2 mm wide. Labellum trilobed, 8.5 mm long; hypochile retrorse saccate-spurred, obtuse, 3 mm long, 2.0-2.9 mm wide laterally, sac 1.50-1.75 mm long; ligula subquadrate, shortly bilobed, shallowly truncate-retuse, minutely papillose-pubescent on lateral margins; epichile transversely elliptic to rhombic, broadly retuse to truncate, base with 2 oblong-obliquely triangular calli, 5.5-6.9 mm long, 7.50-8.75 mm wide. Column obliquely erect, semiterete-clavate, midwing broadly rounded, 3.9-4.0 mm long (3 mm long minus anther cap).

Distribution: Papua New Guinea.

Specimens examined: Papua New Guinea, Southern Highlands Prov., Ialibu Subdistr., near Ialibu, 2040 m, 22 June 1969, *M. Coode, P. Wardle & P. Katik NGF 40336* (K). Central Prov., Alola, 3 January 1936, *C.E. Carr 16895* (BM); The Gap, 2135 m, 9 December 1935, *C.E. Carr 10462* (A, AMES, BM, K).

Habitat: On *Castanopsis* in rainforest (type), or disturbed rainforest (*NGF 40336*), 1400-2135 m.

Etymology: From the Latin *flexuosus,* tortuous or winding, in reference to the flexuous stems in the type specimen. This species is externally identical to



Agrostophyllum flexuosum – A. stem; B. lateral sepal; C. dorsal sepal; D. petal; E. labellum (keels and ligula arrowed); F. column. A and B-F to respective scales. Drawn from holotype.

A. curvilabre J.J.Sm. and is probably misdetermined as such in some herbaria. It differs from *A. curvilabre* in having a sessile, transversely elliptic to rhombic (not clawed, flabellate) labellum epichile and a more slender, semiterete-clavate (not stout, conical) column.

subsp. ***peloricum*** Ormerod, *ssp. nov.*
Type: Papua New Guinea, New Britain, Pomio Subdistr., Mt. Lululua, mapping site, 1790 m, 13 May 1973, *P.F. Stevens & Y. Lelean LAE 58510* (Holotype: L!; Isotypes: K!; LAE!).
A subspecies typica floribus regularis differt.

Epiphytic herb. Roots terete, 1.5 mm thick. Stems subcompressed, covered by leaf sheaths, sublaxly 7 leaved, 13.5-19.0 cm long, 0.6 cm thick basally, 0.9-3.0 cm wide across sheaths above. Leaves erect, ovate to ovate-lanceolate when small, ligulate to oblong-ligulate when larger, apex tridentate, 4.0-17.5 cm long, 1.60-2.35 cm wide; leaf sheaths with a translucent to black margined 1-2 mm wide edge, exposed part 3.0-5.5 cm long, 1.1-1.5 cm wide laterally; stipules deltate to obliquely deltate, acute to obtuse, to 2 mm long. Inflorescence terminal, composed of numerous bracts, sheaths and flowers, to 1.5 cm long, ca. 3.5 cm wide, 4.0-5.0 cm wide in capsule. Pedicellate ovary cylindric-clavate, 6-7 mm long; capsules fusiform, costate, ca. 15 mm long, 3.5 mm thick.

Flowers whitish, possibly self-fertilising. Dorsal sepal broadly ovate, acute, 3 veined, weakly carinate towards apex, 5.75 mm long, 3.5 mm wide. Lateral sepals ovate, thickly apiculate, 3 veined, carinate near apex, 5.75 mm long, 3.2 mm wide. Petals oblong-lanceolate, acute, 3 veined, 4.8 mm long, 2.2 mm wide. Labellum entire, broadly oblong-lanceolate, acute, 3 veined, 4.8 mm long, 2.5 mm wide. Column simple, semiterete, underside unadorned, 3.1 mm long.

Distribution: Papua New Guinea (New Britain).

Habitat: *Nothofagus* dominated moss forest, 1790 m.

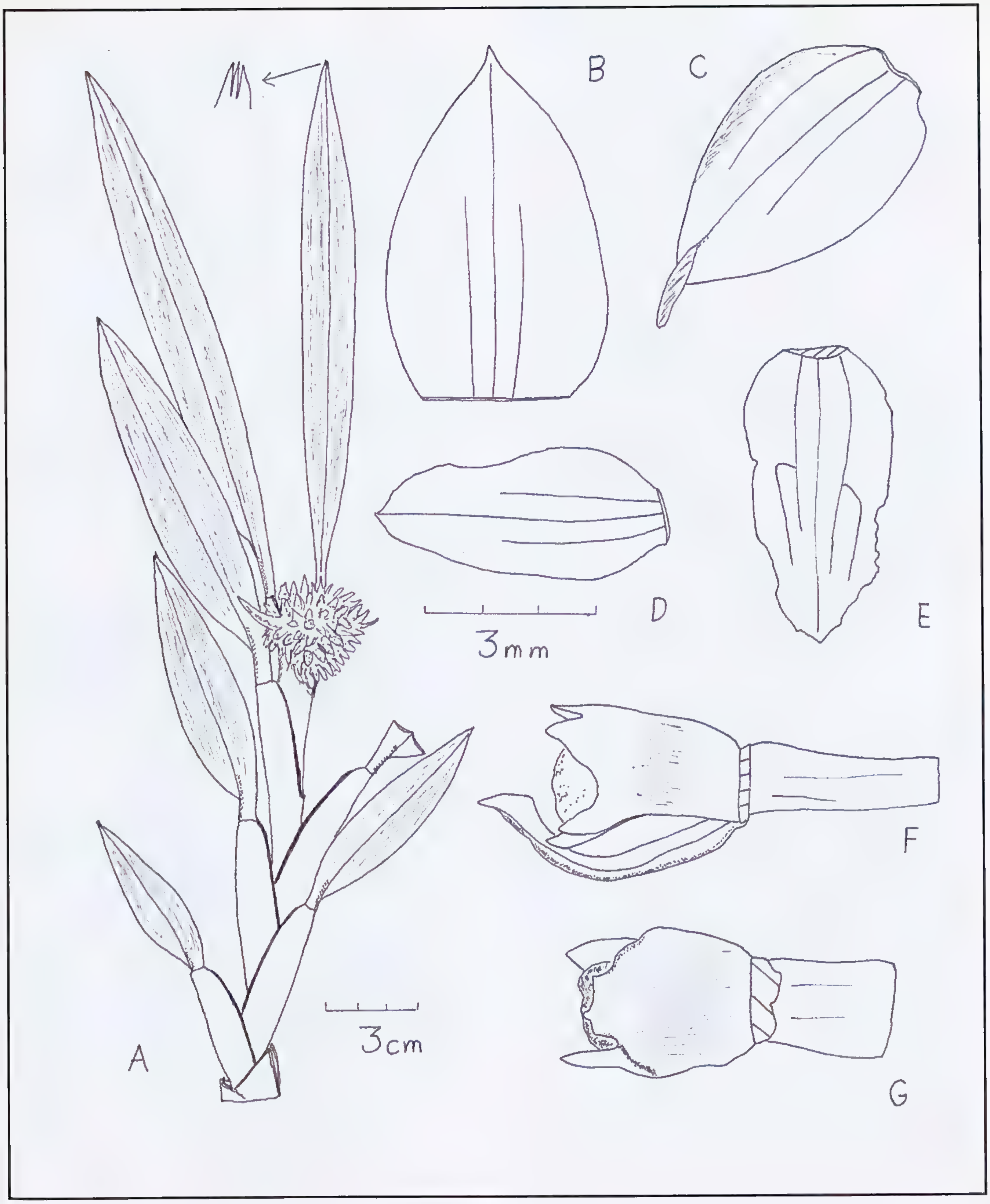
Etymology: From the Classical Greek *pelor,* a monster, in reference to the monstrous or abnormal flowers.

This entity differs from the typical subspecies in having teratological flowers. A collection from nearby New Ireland [*M. Sands et al. 2252* (K)] appears to be a self-fertilising entity judging from the high fruit-set. Unfortunately the New Ireland plant only bears capsules without any floral fragments. However the column is still present and this has a prominent substigmatic appendage (unlike the unadorned column of subsp. *peloricum*); it may represent a new taxon in the *A. flexuosum* complex.

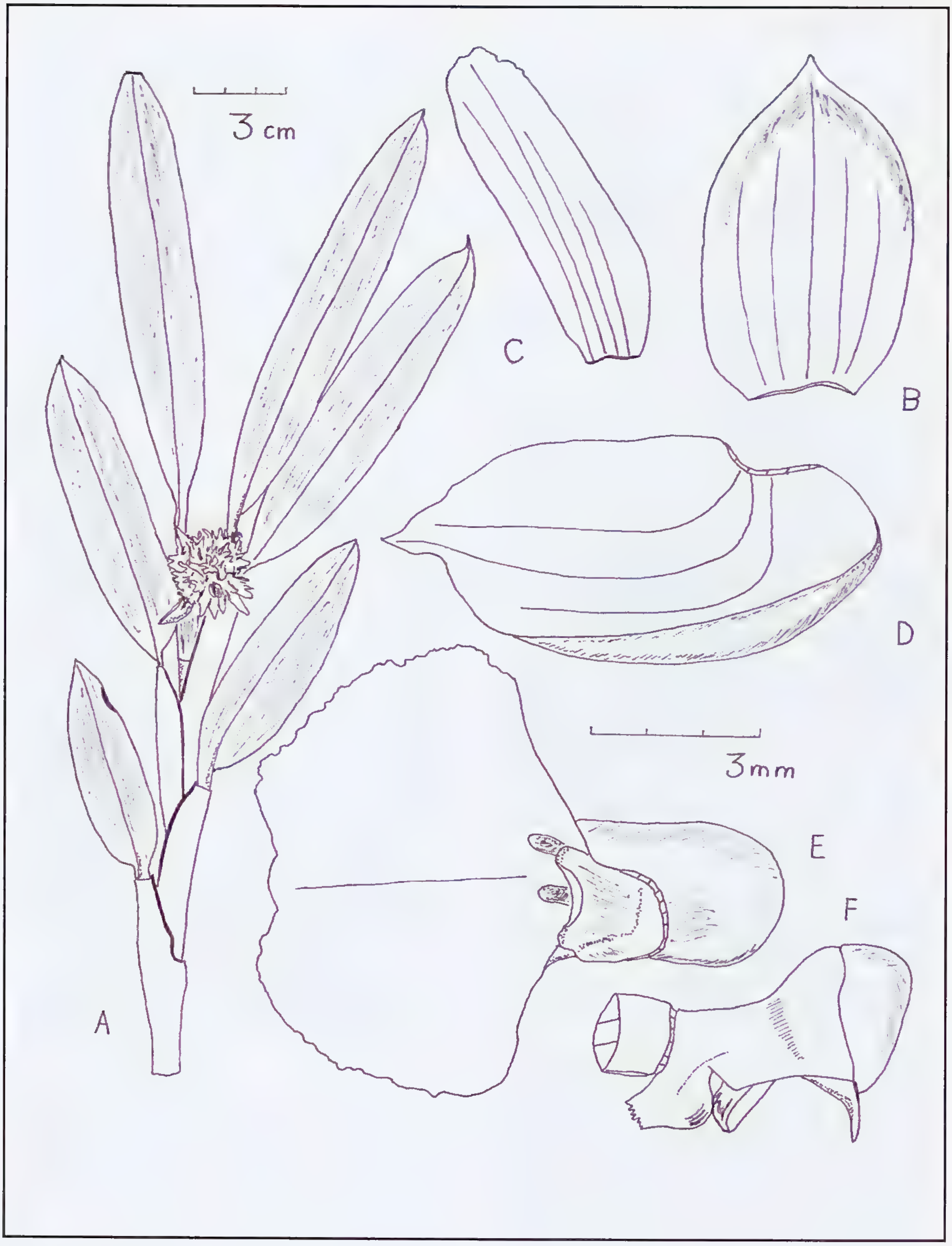
subsp. ***telefominense*** Ormerod, *ssp. nov.*

Type: Papua New Guinea, West Sepik Prov., Telefomin Subdistr., between Busilmin "Airstrip" and Din River, 1400 m, 28 March 1975, *W.R. Barker LAE 66850* (Holotype: L!; Isotype: LAE).

A subspecies typica aliis columna recto et basi truncatis (vs. sublobulatis) differt.
Epiphytic herb. Roots terete, slender, 0.5-1.0 mm thick. Stems caespitose, semiterete basally, compressed above, usually wholly enclosed by leaf sheaths, rarely partly exposed at dorsal base of leaf sheaths, 7 leaved, 9-19 cm long, to 0.9 cm wide above. Leaves ligulate, apex tridentate, lower 4 leaves with a more rounded ovate base, upper 3 with a narrower base, dark green, glossy,



Agrostophyllum flexuosum ssp. peloricum – A. stem; B. dorsal sepal; C. lateral sepal; D. petal; E. labellum; F. flower minus tepals; G. column, ventral. A and B-G to respective scales. Drawn from holotype.



Agrostophyllum flexuosum ssp. telefominense – A. stem; B. dorsal sepal; C. petal; D. lateral sepal; E. labellum; F. column. A and B-F to scale. Drawn from holotype.

7.3-15.2 cm long, 2.0-2.4 cm wide; leaf sheaths black margined, exposed part 5-6 cm long, 0.8-0.9 cm wide laterally; stipules deltate to deltate-lanceolate, acute, to 2 mm long. Inflorescence terminal, with several papery sheaths to 1.5 cm long, composed of several bracts, sheaths and some flowers, ca. 2.5 cm wide. Pedicellate ovary narrowly clavate, sparsely furfuraceous, ca. 7.9 cm long.

Flowers externally sparsely furfuraceous, white, lip pale yellow, pollinia (anther cap?) pale brown. Dorsal sepal broadly ovate-elliptic, acute, 5 veined, lightly carinate, 5.8 mm long, 4 mm wide. Lateral sepals obliquely ovate-elliptic, acute, 3 veined, upper half with midvein carinate, basal quarter enclosing spur, 8 mm long basally (6 mm long along midvein), 4.9 mm wide. Petals oblong-ligulate, apex irregular-subacute, 4 veined, 5.5 mm long, 1.9 mm wide. Labellum trilobed, 8.2 mm long; hypochile retrorse saccate-spurred, obtuse, ca. 3 mm long, 1.8-1.9 mm wide laterally, sac ca. 1.5 mm long; ligula subquadrate, widely bilobed; epichile transversely elliptic-trapeziform, subtruncate, base with 2 oblong calli, 5.2 mm long, 7 mm wide. Column semiterete, clavate, wings slightly curved-straight with a truncate base, ca. 3.95 mm long (ca. 2.9 mm long minus anther cap).

Distribution: Papua New Guinea.

Specimen examined: Papua New Guinea, West Sepik Prov., Telefomin Subdistr., top of ridge S of Busilmin, N of confluence of Bielga and Mogofola Rivers, 2100 m, 25 May 1975, *A. Vinas & J. Wiakabu LAE 59623* (L).

Habitat: Secondary montane rainforest (type), and dense rainforest cleared by cyclonic wind, 1400-2100 m.

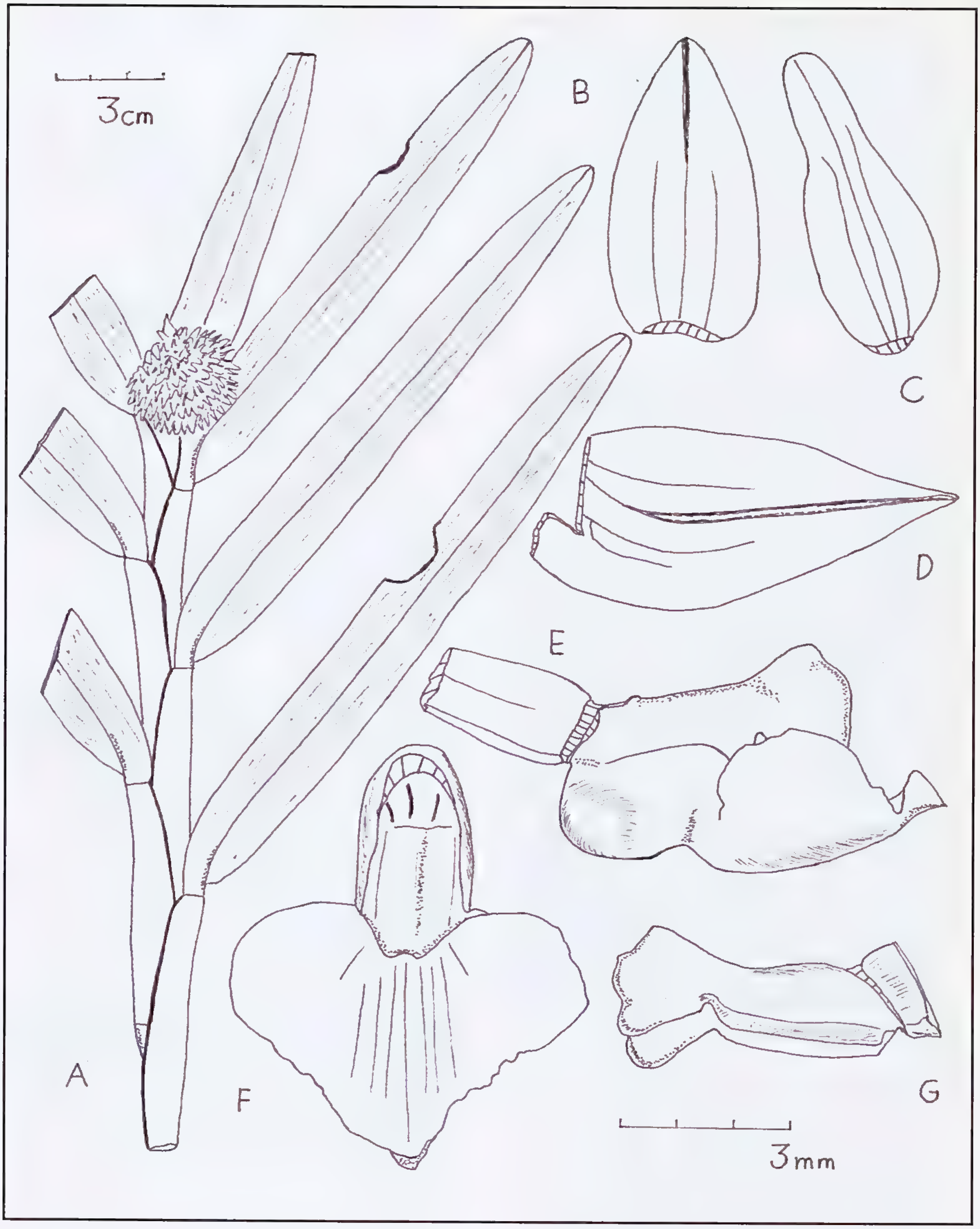
Etymology: Named after the Telefomin area, the type locality.

This entity agrees with the typical subspecies in having a sessile labellum and a clavate column. It however differs in the column having wings with an almost straight margin with a truncate base.

Agrostophyllum kerenganum Ormerod, *sp. nov.*
Type: Papua New Guinea, West Sepik Prov., Bewani Subprov., N of Bewani Patrol Post, 150 m, 28 August 1985, *K. Kerenga LAE 55415* (Holotype: L!; Isotype: LAE).
Affinis A. potamophila Schltr. *sed foliis laxioribus (4.8-6.2 vs. 3.85-4.50 cm distantibus), longioribus (15.8-19-5 vs. ad 14 cm) et brevistipulatis (vs. estipulatis) differt.*

Epiphytic herb. Roots, rhizome and lower part of stem not seen. Stem fragment compressed, laxly leafy, 21.5 cm long, 1 cm wide, 1.2-1.9 cm wide across sheaths. Leaves ligulate to ligulate-lanceolate, obtuse, shortly mucronate, thinly coriaceous, 4.8-6.2 cm apart (leaf sheath tip to leaf sheath tip), 15.8-19.5 cm long, 1.95-2.05 cm wide; leaf sheaths smoothly striate dry, with a 0.5-1.5 mm wide black margin, 4.5-7.2 cm long, 0.70-1.25 cm wide laterally; stipules deltate, incurved, acute, fragile, to ca. 1 mm long. Inflorescence terminal, subglobose, composed of numerous bracts and sheaths, densely many flowered, ca. 3.5 cm wide. Pedicellate ovary subcylindric-clavate, 8 mm long.

Flowers white with purple blotches (presumably a pair on the epichile). Dorsal sepal ovate-elliptic, obtuse, weakly carinate in apical third, 3 veined, 5 mm long, 2.4 mm wide. Lateral sepals obliquely ovate-lanceolate, acute, carinate, 3 veined, 7 mm long basally



Agrostophyllum kerenganum – A. stem; B. dorsal sepal; C. petal; D. lateral sepal; E. flower minus tepals; F. labellum; G. column. A and B-G to respective scales. Drawn from holotype.

(6 mm long medially), 2.95-3.00 mm wide. Petals oblong-lanceolate, obtuse, 3 veined, 5.2 mm long, 2 mm wide. Labellum trilobed, ca. 6.6 mm long; hypochile subglobose-saccate, ca. 2.9 mm long; ligula a thick, obliquely deltate (in lateral section), obtusely emarginate callus that projects slightly over the base of the epichile; epichile trilobulate, widely ovate-reniform, subacute, ca. 3.7 mm long, 5.75 mm wide. Column semiterete-clavate, 3.95 mm long.

Distribution: Papua New Guinea.

Habitat: Lowland rainforest, 150 m.

Etymology: Named after Karl Kerenga, collector of the type.

This species is a member of the *A. longifolium* (Blume) Rchb.f. complex, it is most similar to the Papua New Guinean *A. potamophila* Schltr. but its stems are more laxly leafy (leaves 4.8-6.2 vs. 3.85-4.50 cm apart) with longer (15.8-19.5 vs. to 14 cm long) leaves that have shortly stipulate (vs. estipulate) sheaths.

Another similar Papua New Guinea taxon is *A. crassicaule* Schltr. but it differs in having thicker, semiterete (not compressed) stem with shorter (9-13 vs. 15.8-19.5 cm) leaves and flowers with a smaller, less oblique ligula.

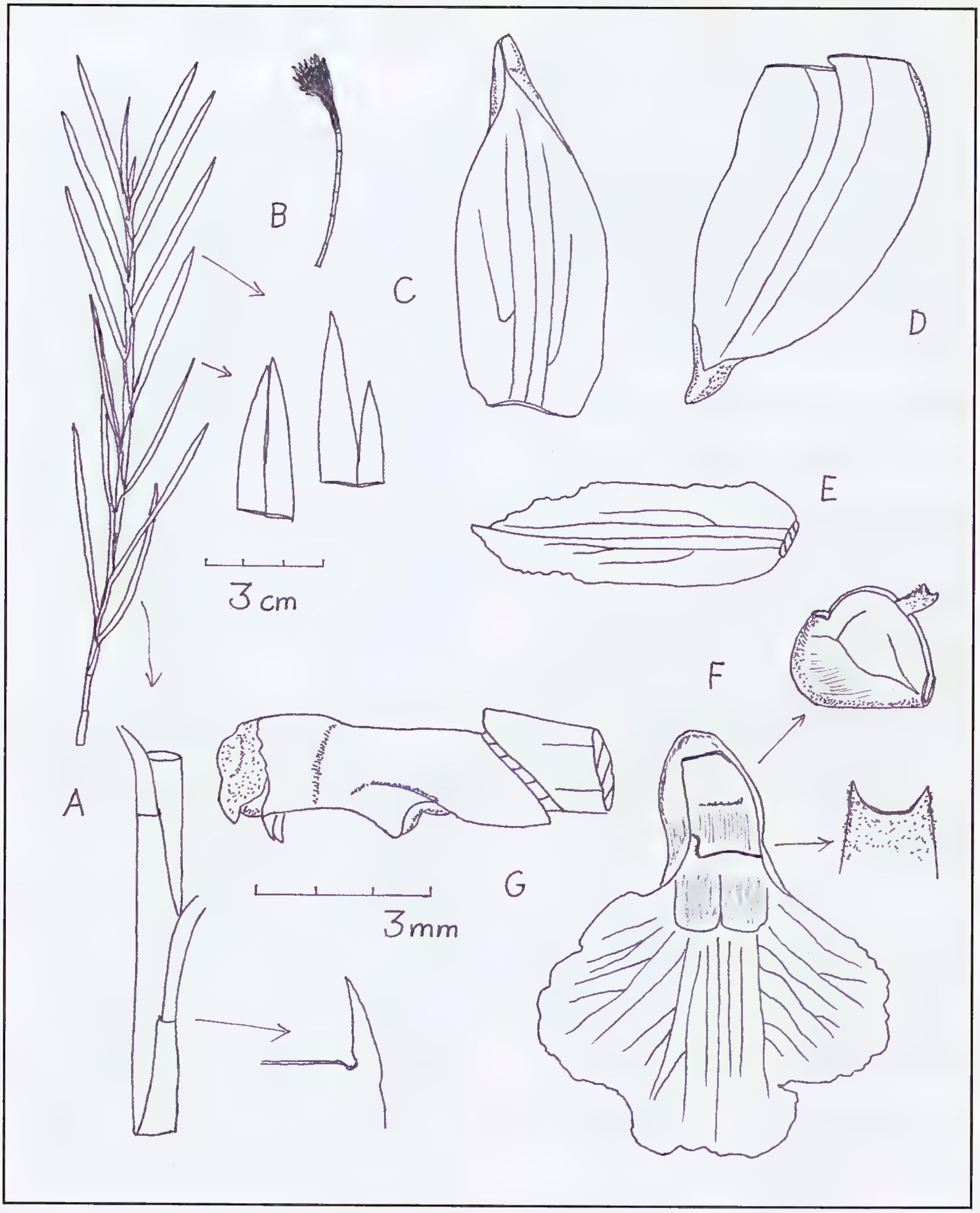
Agrostophyllum wagiribuanum Ormerod, *sp.nov.*

Type: Papua New Guinea, Southern Highlands Prov., Nipa District, SW Lake Kutubu, Mt. Wagiribu, ca. 1200 m, 10 September 1982, *T.M. Reeve 5434* (Holotype: K!; Isotypes: LAE, NSW).

Affinis A. montanum Schltr. *sed vaginis foliis stipulatis (non estipulatis), petalis floribus oblongo-lanceolatis (non oblongo-ligulatis) et columna recto (non oblique erectis) differt.*

Epiphytic herb. Roots terete, 0.8 mm thick. Stems caespitose, slender, terete basally, slightly compressed above, sublaxly many leaved, 29-35 cm long, 0.075-0.150 cm thick, 0.20-0.25 cm wide across leaf sheaths; internodes 0.7-1.3 cm long. Leaves linear-ligulate, apex inequally bidentate, thin, 32-49 mm long, 1.7-2.3 mm wide, tips 0.8-2.0 mm long; leaf sheaths black margined, sometimes not, closing about halfway down the internode; stipules lanceolate, acute, 0.8-1.3 mm long. Inflorescence terminal, composed of several bracts and sheaths that break down into fibrous remnants, successively one to few flowered, 10-15 mm long, 5-10 mm wide. Pedicellate ovary clavate-triquetrous, 5 mm long.

Flowers white, lip with yellow on centre. Dorsal sepal elliptic-lanceolate, acute, carinate in apical third, 3 veined, 6 mm long, 2.7 mm wide. Lateral sepals obliquely ovate-elliptic, acute, shortly thickly carinate near apex, 3 veined, 6.2 mm long basally (6 mm long medially), 3 mm wide. Petals oblong-lanceolate, acute, margin irregular, 3 veined, 5 mm long, 1.8 mm wide. Labellum trilobed, ca. 6.4 mm long; hypochile shortly retrorse saccate, ca. 2.2 mm long, 1.75 mm wide laterally, sidelobes widest halfway, rotundate; ligula subquadrate-cuneate, widely bidentate, papillose-pubescent, raising 0.8-0.9 mm above sidelobes; epichile trilobulate, margins irregular, 4.2 mm long, 5.4 mm wide, midlobule transversely oblong, irregularly truncate-emarginate with an apiculus below the apex, ca. 1 mm long, 2.85-2.90 mm wide. Column semiterete, stoutish, medially with deltate, obtuse lateral wings, 4.2 mm long with anther cap (3.75 mm long minus anther cap).



Agrostophyllum wagiribuanum – A. stem, upper part; B. leafless stem with inflorescence; C. dorsal sepal; D. lateral sepal; E; petal; F. labellum; G. column. AB and C-G to respective scales. Drawn from holotype.

Distribution: Papua New Guinea.

Etymology: Named after Mt. Wagiribu, the type locality.

This taxon is similar to *A. montanum* Schltr. but differs in having stipulate (vs. estipulate) leaf sheaths, broader, oblong-lanceolate, irregularly margined (vs. narrower, oblong-ligulate, entire) petals and an unraised, medially winged (vs. obliquely erect, exalate) column.

Acknowledgements.

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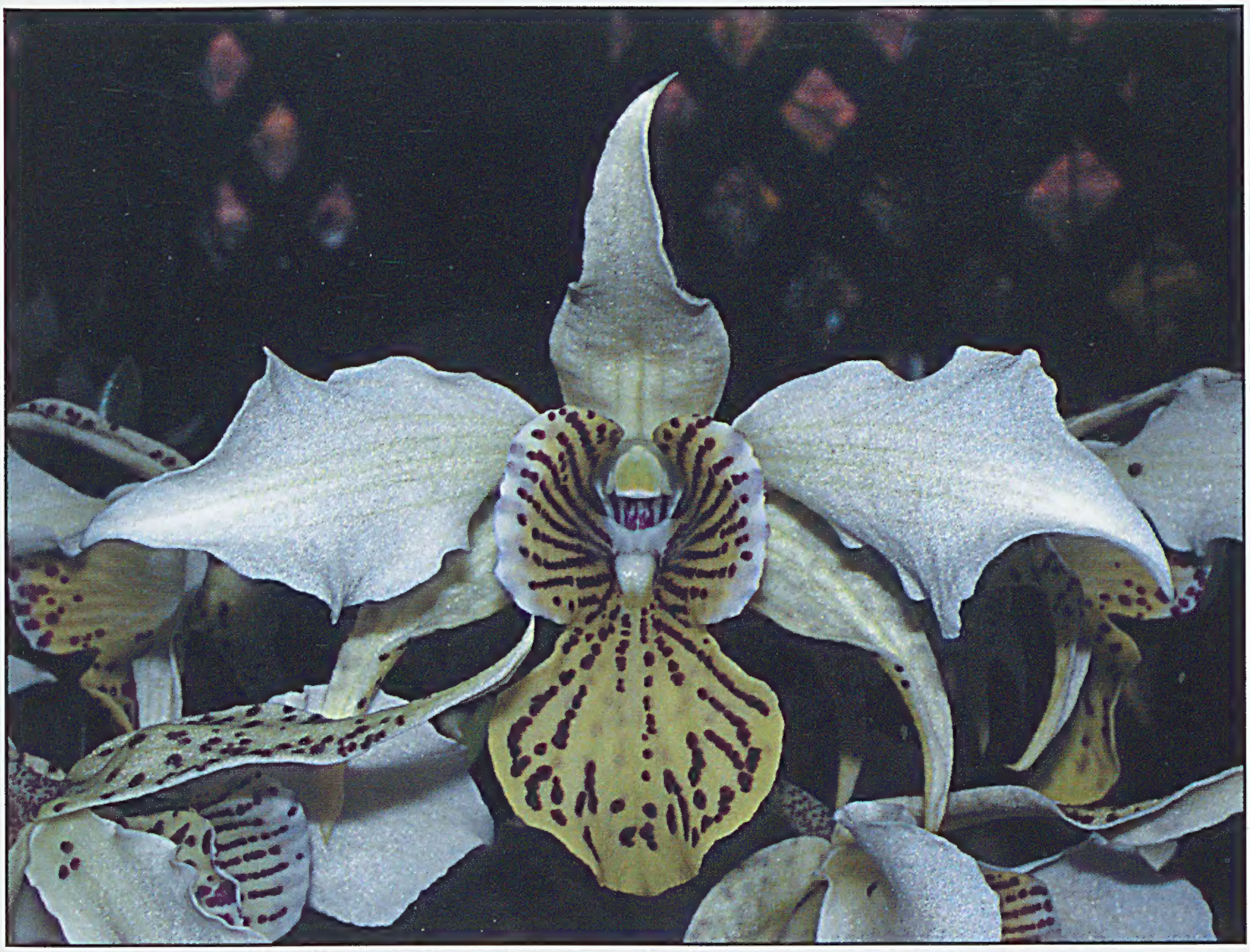

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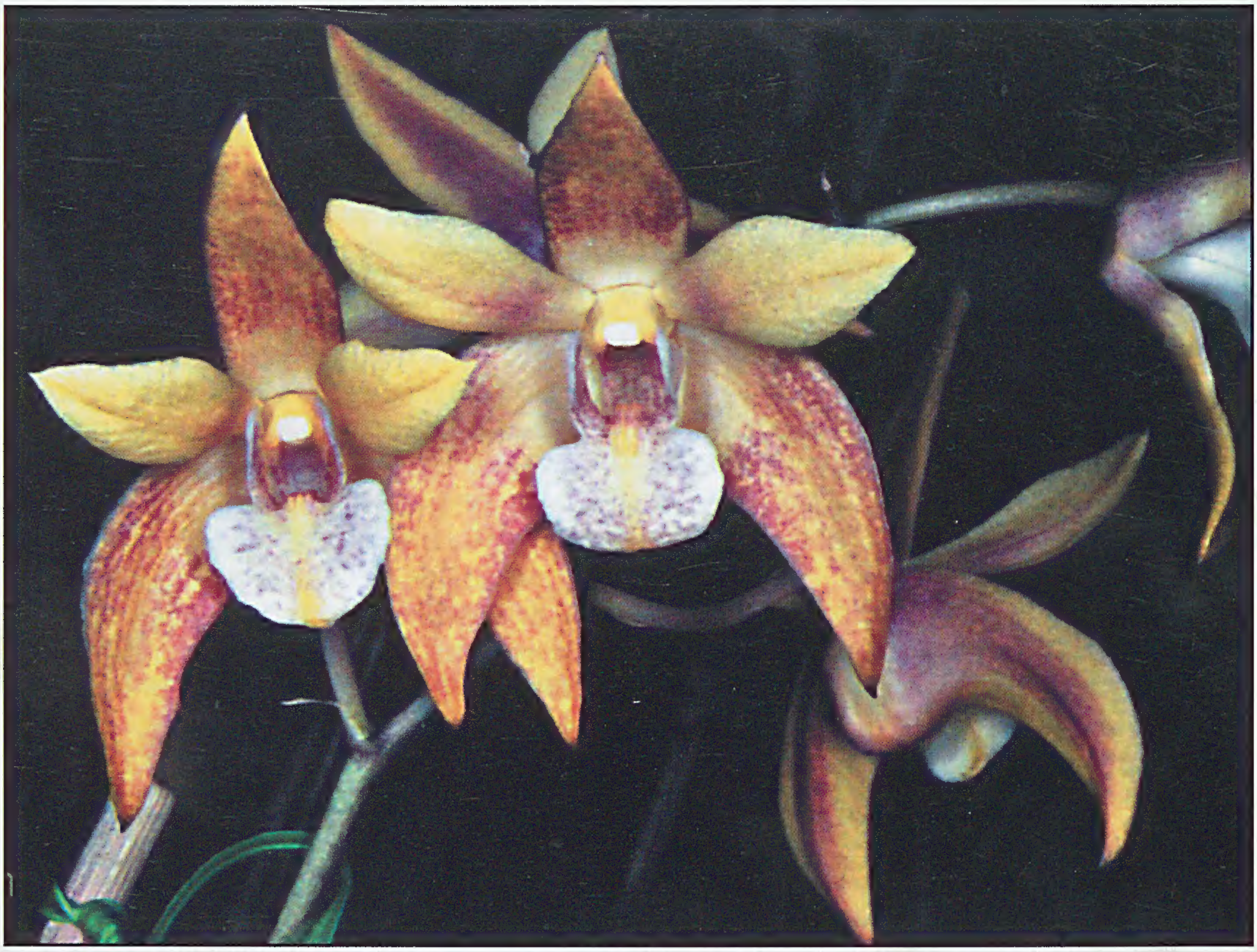

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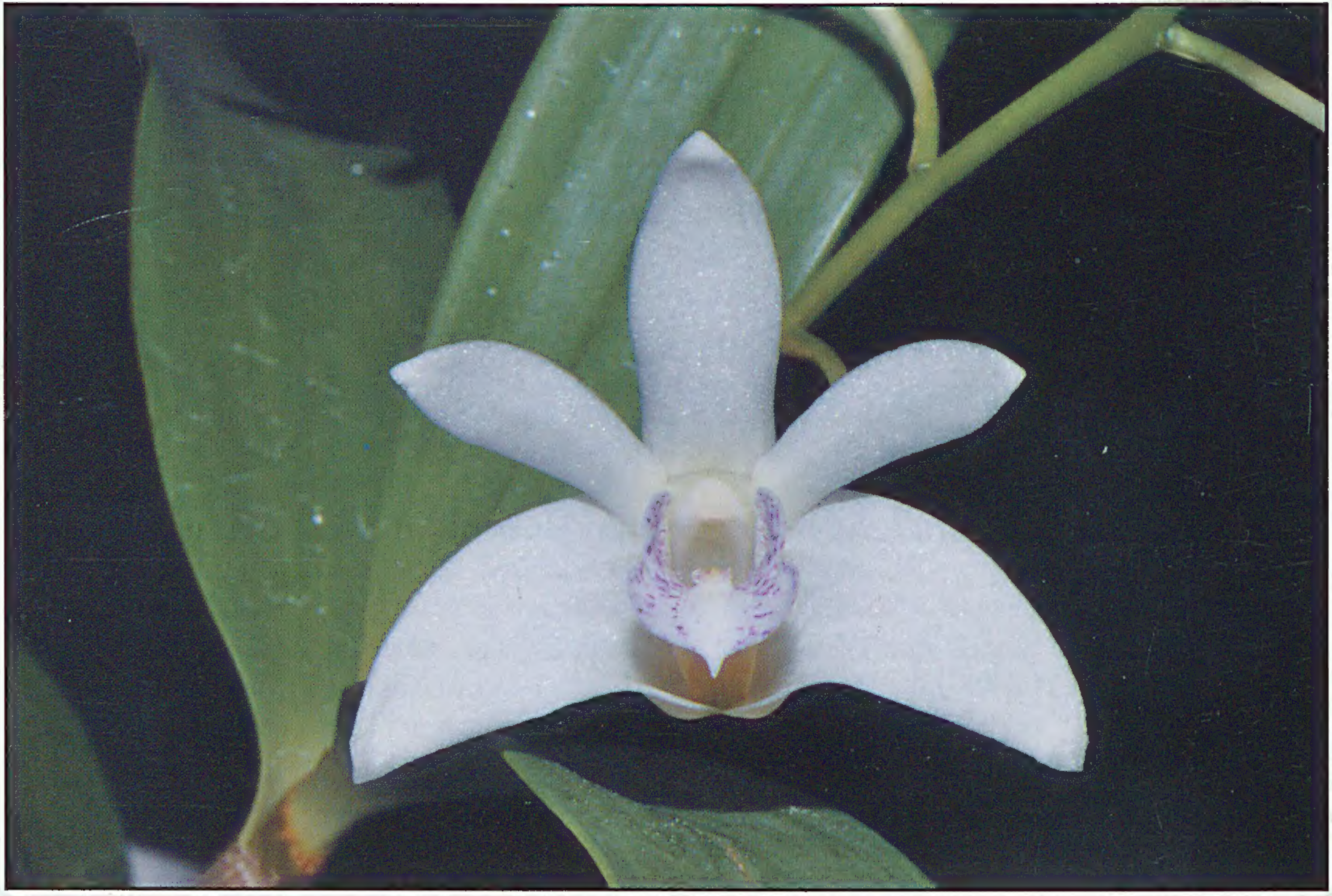

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